

For Reference

NOT TO BE TAKEN FROM THIS ROOM

For Reference

NOT TO BE TAKEN FROM THIS ROOM

Ex libris
UNIVERSITATIS
ALBERTAENSIS





thesis
1966(F)
#104

THE UNIVERSITY OF ALBERTA

SOME EFFECTS OF IMPOSED CONTROLS IN SUBJECT MATTER AND
ART MEDIA CHOICE UPON THE DRAWINGS OF SENIOR
HIGH SCHOOL STUDENTS

by

RONALD N. MACGREGOR

A THESIS

SUBMITTED TO

THE FACULTY OF GRADUATE STUDIES

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE
MASTER OF EDUCATION

DEPARTMENT OF SECONDARY EDUCATION

EDMONTON, ALBERTA

AUGUST, 1966

THE UNIVERSITY OF ALBERTA

FACULTY OF GRADUATE STUDIES

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies for acceptance, a thesis entitled "SOME EFFECTS OF IMPOSED CONTROLS IN SUBJECT MATTER AND ART MEDIA CHOICE UPON THE DRAWINGS OF SENIOR HIGH SCHOOL STUDENTS," submitted by Ronald Norman MacGregor in partial fulfillment of the requirements for the degree of Master of Education.

ABSTRACT

Problem

This experimental study investigated the variations in drawings produced by four senior high school classes on the Art 10 (elective) programme. Each class received instruction which was adapted to varying degrees of teacher imposed controls on student choice of subject matter and media. The questions on which this study was based were felt to be appropriate to the problem of instituting a programme capable of assisting students to develop in art without either inhibiting them by the imposition of too many restrictions, or leaving them to flounder by a reluctance to set definite project limits.

A background to the task of determining appropriate limits on freedom of choice in student art activity was provided in the review of several contemporary studies devoted to "depth" versus "breadth" instruction, the analysis of certain variables involved in problem solving, and the investigation of personality patterns which, in the form of "art working strategies," may have an effect on the type of art programme a particular teacher develops.

Procedures

Four classes of Art Ten (elective) students from an Edmonton composite high school were assigned the following treatments over a two week period: Group One was restricted to one arrangement of subject matter and one medium; Group Two had a range of subject matter to choose from but only one medium with which to work; Group Three was restricted to one arrangement of subject matter but could employ a variety of media; and

Group Four had a range of both subject matter and media from which to choose.

Ten lessons were taught to each of the four groups, employing the theme "Nature." Subject matter for Lessons One and Ten, which provided the pre-test and post-test material, was in the form of still lifes. Evaluation of pre-test and post-test material was performed by six expert art judges employing an objective scoring procedure designed by the researcher. The evaluative instrument purposed to assess the use made of eight criteria which had also formed the foci of instruction to all four groups. Information on student attitude towards the programme was obtained from questionnaires completed by the students during the first and the second week of the experiment.

Findings

Analysis of the data revealed that Group One, restricted in both subject matter and media choice, achieved consistently better results than did the other groups in terms of the judged criteria. Significant differences among groups occurred at the .01 level on three criteria, and at the .05 level on a further three. In the remaining two cases, no significant differences were recorded.

Conclusions

The findings appear to point to the inaccuracy of assuming that limitation of choice in art activity necessarily results in the students' suffering deprivation. What seems to occur when subject matter and media choices are restricted is that the student develops sufficient familiarity with these factors to feel able to use them to improvise and to explore in

a creative manner. It must, however, be stressed that the challenge to improvise creatively is acceptable only if the student is suitably motivated. Such motivation can, in turn, be achieved only if sufficient visual and verbal stimuli are utilized.

ACKNOWLEDGMENTS

Many people rendered valuable advice and assistance in the development and execution of this study. The writer acknowledges his debt of gratitude to them, and wishes to mention particularly Dr. Bernard Schwartz, who, as Chairman of the Thesis Committee, offered kindly and constructive advice throughout. Thanks are also due to Dr. R. R. Rath, and to Professors E. W. Kemp and H. Diemert, all of whom were members of the Thesis Committee.

The cooperation of Mrs. Ruth Ford and the student members of the Art Department of Bonnie Doon Composite High School is acknowledged; as is the assistance provided by Mr. Jim Simpson and the Edmonton Public School Board.

The efforts of Mr. D. Flathman, and of Miss H. Verdin are also appreciated.

Finally, the writer wishes to thank his wife Peggy for her unlimited sympathy and encouragement during the past year.

TABLE OF CONTENTS

CHAPTER		PAGE
I.	DISCUSSION OF THE PROBLEM.	1
	Introduction and Background to the problem.	1
	Statement of Problem.	5
	Statement of Hypotheses	6
	Definition of Terms	6
	Limitations and Assumptions	8
	Rationale for the Study	9
	Justification of the Elements in the Study.	10
II.	REVIEW OF LITERATURE AND RELATED RESEARCH.	14
	General Overview of Literature concerning Freedom of Choice within Art Education Practice.	14
	Recent Theories and Experiments Dealing with the Imposition of Restrictions	19
	Research in the Establishment of Objective Evaluation Criteria	25
	The Effects of Teacher Working Strategy on Student Working Strategy	31
	Summary of the Review of Literature	33
III.	CONDUCT OF THE STUDY	36
	Setting of the Study.	36
	Population Employed in the Study.	36
	Preparation and Collection of Materials Employed in the Classroom Treatments.	36
	Procedure	37

CHAPTER

PAGE

Progress Evaluation and Self-Assessment	
Questionnaires	40
Summary of Experimental Procedure	41
IV. COLLECTION OF DATA AND DESCRIPTION OF STATISTICAL	
PROCEDURES.	43
Establishment of the Evaluative Instrument.	43
Identity of Judges.	45
Scoring Procedure for Pre- and Post-test Art Works. . .	45
Reliability of Obtained Scores.	45
Justification of the Use of Expert Art Judges	
Judges to Evaluate Student Work	45
Inter-judge Reliability.	46
Statistical Procedures for Analysis of Data.	49
Acceptable Levels of Significance for Statistical	
Data.	52
Summary of Chapter IV.	52
V. ANALYSIS OF FINDINGS	54
Findings concerning Differences between Experimental	
Treatment Groups	54
Discussion of Results	66
Summary of Results derived from the Hypothesis	
concerning Differences among Experimental	
Treatment Groups.	68
Findings concerning Homogeneity of Regression	69

CHAPTER	PAGE
Descriptive Analysis of Questionnaire Data.	71
Group One.	71
Group Two.	72
Group Three.	75
Group Four	77
Summary of Inferences.	79
Determination of Influence of Teacher Strategy upon Student Strategy.	80
Summary of Chapter V.	80
VI. SUMMARY AND IMPLICATIONS OF THE STUDY.	83
Summary of Procedures and Major Findings.	83
Limitations, Implications, and Recommendations for Art Education.	84
BIBLIOGRAPHY	90
APPENDIX A Sequence of Lessons followed by Experimental Groups . .	95
APPENDIX B Summaries of Lessons presented to Experimental Groups .	98
APPENDIX C Photographs of Still Lives; and Selected Drawings . . .	108
APPENDIX D Composite Judge Scores on Selected Drawings	113
APPENDIX E Copy of Progress Evaluation and Self-Assessment Questionnaire.	115
APPENDIX F Correlations for Inter-judge Reliability.	118

LIST OF TABLES

TABLE	PAGE
I. Choices made in Media and Subject Matter by Students in Unrestricted Groups.	42
II. Lowest, Median, and Highest Obtained Inter-judge Correlations on Each Criterion	47
III. Results of an Analysis of Covariance to test the Hypothesis of no Differences in Mean Gains among Groups over Eight Criteria.	55
IV. Results of a Procedure to test a Hypothesis for Homogeneity of Regression among Groups over Eight Criteria	70
V. Questionnaire Ratings assigned by Group One Students.	73
VI. Questionnaire Ratings assigned by Group Two Students.	74
VII. Questionnaire Ratings assigned by Group Three Students.	76
VIII. Questionnaire Ratings assigned by Group Four Students	78
IX. Chi Square applied to Randomized Scores to determine Influence of Teacher Strategy upon Student Strategy.	82

LIST OF FIGURES

FIGURE	PAGE
1. Breakdown of Groups and Assigned Treatments.	38
2. Score Card employed by Judges.	44
Comparative Achievement by Groups as Determined by Adjusted Regression Weights; and Relative Significance of the Sub-Components (Variables) Involved on the Following Criteria:	
3. Criterion One: Variety within Shapes	56
4. Criterion Two: Connectedness and organizational unity.	58
5. Criterion Three: Rearrangement	59
6. Criterion Four: Imagination - drama.	61
7. Criterion Five: Imagination - exaggeration	62
8. Criterion Six: Use of Texture.	64
9. Criterion Seven: Gradation of values	65
10. Criterion Eight: Variety between shapes.	67

CHAPTER I

DISCUSSION OF THE PROBLEM

Introduction and background to the problem

One of the policies of art education in recent years has been to encourage the utilization of a wide variety of media combined with the presentation of an equally wide choice of subject matter, the object being a cultivation within the mind of the student of the idea of the almost limitless exploratory potential in art experiences. Manifestations of this philosophy have occurred in such movements in art as Synthetic Cubism and in such organizations as the Bauhaus. In the one case a number of unusual materials was used for artistic ends, opening the eyes of both artist and public to new possibilities in the combination of hitherto untapped sources for artistic invention; in the other, the prevailing "geist" was one of experiment, in which product unacceptability on established aesthetic grounds was a principle continually brought into question and often modified in the light of the demonstrable acceptability of the newly created work.

The "Bauhaus attitude" found ready disciples in North American schools of the 1930s where Dewey's concept of a child-centered curriculum was taking shape, and continuing support for a philosophy which supports exposure to a wide variety of experience is evident in the words of Marion Quin Dix, from an address delivered to a Unesco symposium in the 1950s:

Every human being must do his own learning; the teacher can at best but contrive an environment from which the learner will take according to his needs. Thus, all learning should be self-directed ... Thus we will ensure his constant creative independence, so that all unexplored possibilities, new media, and every fresh corner of his world, will be approached with special interest, which will extend to include ideas of his own and the suggestions of the group.¹

Concurrent with the desire to utilize a variety of materials together with some latitude in subject choices has been the evidenced interest of many artists in the exploitation of one particular technique or in the systematic exploration of one subject area. One is reminded of Matisse's succession of interior studies; or Degas' ballet dancers; while in the later works of Frans Hals the artist seems deliberately to be trying for maximum effect within severe self-imposed limitations. Examples of what might be termed a rigorous approach to the creation of art objects proliferated during the Middle Ages, when a youth with artistic aspirations had to serve a lengthy and painstaking apprenticeship under a recognized master before striking out on his own. Thus Leonardo da Vinci spent several years in the studio of Verrochio, developing within the narrow context of painting and drawing those diverse faculties which marked him off as one of the most versatile men of all time.

The setting up of a school programme in art which might permit either an approach in breadth over a multiplicity of subject areas or an in-depth working arrangement within a limited segment of the artistic spectrum thus has some historical precedent. Current practice among

¹Marion Quin Dix, "Planning Art Experiences," Education and Art: a UNESCO symposium, ed. E. Ziegfeld (Paris: Unesco, 1953), p. 35.

provincial curriculum bodies inclines to advising that elementary school children be exposed to many media and content stimuli, so that they may be fully aware of the possibilities of art materials in solving problems creatively; while at the secondary level additional emphasis is given to the type of sequential pattern which promotes exploration in a specific area of interest.²

The findings of an investigation conducted by Gaitskell³ between 1948 and 1954 in Ontario revealed that actual classroom practice varied greatly within that province. Some teachers believed in rigid methods which allowed little or no choice in subject matter or media, while others gave complete freedom of choice both in subject matter and in media, formal instruction being negligible.

In general, little agreement exists among teachers and educators on the degree to which freedom to explore in art should be controlled. Statements such as that made by Manuel Barkan to the effect that "it is a hindrance if children collect knowledge through haphazard experiences with many different media before settling down to the serious business of behaving like artists"⁴ are evidence of a particular attitude towards the study of art and the amount of rigour with which that study may be implemented.

²Department of Education, Province of Alberta, Senior High School Curriculum Guide For Art (Edmonton: Govt. Printer, 1958), p. 1.

³Charles and Margaret Gaitskell, Art Education during Adolescence (Toronto: Ryerson Press, 1954), pp. 35-36.

⁴Manuel Barkan, "Transition in Art Education," Art Education, XV (October, 1962), p. 18.

Another contemporary writer,⁵ by declaring that "the child must not be hurried, and he must be allowed to explore and pursue certain media or ideas as extensively as he wishes" reveals a position which, when translated into practice, may well bring about a sequence of art lessons different in character and in conduct from those formulated by educators of a persuasion similar to Barkan's.

One is led to speculate on how much freedom of choice the student may be permitted in the pursuance of his studies in the art room, and on the possible variations that may occur in the works of students who have been closely directed in terms of subject choice or who have been restricted to a narrow range of media. Do such impositions stimulate them by challenging their ability to get the most out of what they have at their disposal? Or does their work suffer to the extent that freedom of choice is absent?

The conditions under which the teaching of art takes place invariably necessitate the imposition of certain bounds on the kind and character of projects which are undertaken, particularly in a school situation, where administrative and technical restrictions have to be recognized. But aside from these, teachers continually ask their students to work within a framework which is more or less elastic, depending on teacher attitude, availability of materials, and the readiness (in terms of experience) of the class. In Elliot Eisner's view:

⁵Pauline Johnson, "Art for the Young Child," Art Education; the Sixty-fourth Yearbook of the National Society for the Study of Education, ed. Hastie (Chicago: University of Chicago Press, 1965), p. 72.

All teachers in art or elsewhere have at least this in common; they all impose conditions upon the student which affect his behavior. By assigning a project, identifying the materials that may be used, by indications of the amount of time available to work on this project, by describing the technique or procedures to be used the teacher of art imposes a host of conditions upon the student.⁶

Statement of Problem

The perennial problem facing art educators is how to enable students to realize their creative potential without either inhibiting their work or leaving them to flounder. Under what conditions will students make the most progress, assuming that progress is both visible and measurable?

The purpose of this study was to find possible answers to such a question through the examination of a school situation in which freedom of choice on the part of the student had been deliberately controlled. Comparisons might thus be made of the effects of varying degrees of imposed control from an analysis of work produced under those conditions.

Specifically the problem was to determine the extent to which variations might occur in the art works of four groups of high school students operating under varying degrees of restriction in terms of subject matter and media choice. One group was to be limited both in the choice of subject matter and of media; the second was to be limited in media choice but was to be allowed a certain freedom of choice in subject matter; the third was to be restricted in subject matter choice

⁶Elliot Eisner, "Towards a new era in Art Education," Studies in Art Education, VI (2), 1965, 60.

while having a certain freedom of choice in media; and the fourth was to have a certain freedom of choice both of subject matter and of media.

Statement of Hypotheses

Hypotheses were drawn up as follows:

For purposes of this research the problem is stated in null hypothesis form. There will be, it is hypothesized, no significant differences in the art products of students who have been over a period of time subjected to varying degrees of imposed control in terms of subject matter and media choice.

H₀(A) There will be no significant differences in mean gains among groups on the judged scores of each of the following criterion variables:

- 1) Variety within shapes
- 2) Connectedness and organizational unity
- 3) Rearrangement
- 4) Imagination--drama
- 5) Imagination--exaggeration
- 6) Use of texture
- 7) Gradation of values
- 8) Dominance/subordination--variety between shapes

H₀(B) There will be no significant differences within each of the four groups in the relationship between pre-test and post-test results on each of the following criterion variables:

- 1) Variety within shapes
- 2) Connectedness and organizational unity
- 3) Rearrangement
- 4) Imagination--drama
- 5) Imagination--exaggeration
- 6) Use of texture
- 7) Gradation of values
- 8) Dominance/subordination--variety between shapes

Definition of Terms

A recognition of the specific sense in which various terms are used in this study is crucial for the proper understanding of what the researcher is attempting to find out. This is particularly the case where "restriction", "non-restriction", "control", and "limitation" are concerned.

1. Restriction definitions

Medium. A mark making device. In this study the media employed included charcoal, pencil, black tempera paint, black conte, and india ink.

Subject matter. The visual or mental stimulus which is translated via the medium into a visible work.

Pictorial content. The visible presence in an art product of elements or configurations resulting from an interpretation of subject matter.

Restriction. The giving of one subject for interpretation; or the assigning of one medium by which a subject or subjects may be interpreted.

Non-restriction. Licence on the part of the student to choose his subject matter from a range of topics given by the instructor; or opportunity to choose any one of five media for the interpretation of a subject or subjects.

Control. An arbitrary condition laid down by the researcher or instructor under which the work is to be carried out. Levels of control refers to the number and kind of controls imposed.

Senior high school students. Students who are taking Art 10 as an elective subject in a senior high school.

2. Rating definitions

Strategy. The approach taken towards the solving of an art problem. It has been subdivided by Burkhardt⁷ into a) Spontaneous strategy,

⁷Robert C. Burkhardt, Spontaneous and Deliberate Ways of Learning (Scranton: International Textbook Co., 1962).

which is emotional and holistic and b) Deliberate strategy, which is objective and controlled.

Divergent strategy. A refinement of Deliberate strategy, the emphasis being on improvisation and progressive interpretation.

Formal strategy. A strategy characterized by a careful and often conventional interpretation of a subject.

Limitations and Assumptions

Administrative Framework. The design of this study is shaped in part by certain limitations and conditions imposed by the programme of education carried on by the Edmonton Public School system.

Time. Since each lesson lasted for forty-five minutes, drawings produced cannot be assumed to represent an end product. No arrangements were made for students to complete drawings at the end of the school day or at the end of the series of lessons.

Depth. The present study should not be regarded strictly as employing a "depth vs. breadth" approach. In a sense all four groups were working in depth, but both restricted subject matter groups were making use of two specific objects (a rock and a branch) and translating concepts via these objects in terms of a drawing, while the non-restricted subject matter groups worked directly from concept to drawing in Lessons Two to Nine, and relied on concrete stimuli of a nature similar to that employed by the restricted groups in Lesson One (pre-test) and Lesson Ten (post-test).

Choice. When the opportunity for choice was present, it was

assumed that students would exercise that opportunity. Students were advised to try all the media at their disposal, but no attempt was made to force them to experiment with the full range since that in itself might constitute a form of restriction. Visual checks revealed that most of the students experimented with all the media available in the course of the experimental lessons. The reader's attention is directed to Table I for information on how much freedom of choice in subject matter and media was exercised in pre-test and post-test situations.

Rationale For The Study

Though experiments in art undertaken with school children are not uncommon, the senior high school levels have been largely passed over by researchers.⁸ Perhaps the reason for their neglect is an alleged lack of spontaneity displayed by adolescents in situations in which they feel unfamiliar or uncertain, in contrast with the ready enthusiasm of children in the elementary school. The writer's study represents an addition to what is at present a meagre accumulation of knowledge about the high school art learning process.

There are still many gaps in our knowledge of the types of situation to which students will respond so as to produce creative work. This study attempts to focus on two of the basic factors in the art process -- subject matter and media -- and to examine through a structured situation certain specific variations which the creative process

⁸Vincent Lanier, Doctoral Research in Art Education (Los Angeles: University of Southern California, 1962).

develops from stimuli generated by these two factors. It attempts a synthesis of studies which either have concentrated on the individual qualities of media, or have been concerned with the interaction of subject matter and media only as a phenomenon incidental to the main purpose of the research.

The value of experiments undertaken in a classroom, in an atmosphere and an environment as nearly identical as possible with the ongoing teaching/learning process, rests in the lack of artificiality which results therefrom. Any conclusions and recommendations which may be advanced as a consequence of such research are readily applicable to any classroom situation. In this way the gap between educational theory and classroom practice is satisfactorily bridged.

Justification of the Elements in the Study

The decision to adopt subject matter and medium as major variables was based on the premise that together they represent the means of giving substance to an idea in the form of a concrete art product. Furthermore, they are exploitable in a classroom situation over a period of time. Finally, they form the foundation of all the criteria to be used in the type of objective scoring outlined in the design of the evaluative instrument.

The limitation of media to those producing monochromatic effects was the result of a desire to have produced works which shared certain common features in terms of the appearance of the final products. The use of colour would introduce an unnecessarily complicating factor in the assessment of the work.

Similarly, subject matter was confined to the theme "Nature", one which offers a rich cross-section of material while ensuring that commonality necessary for comparisons among the groups. (See Appendices A1, A2.) Articles by Henkes⁹ and Linderman¹⁰ support the assumption that natural forms provide suitable subject matter for creative problem-solving activity. One branch and one rock were employed as subject material for those groups in which subject matter was restricted; both objects have individual and distinct characteristics and identities.

A recent dissertation¹¹ has indicated that there may be a sharp increase in creativity between the ages of fifteen and eighteen; while other data, offered by a contemporary researcher, point to a decline in creativity after the age of fourteen.¹² In view of such conflicting evidence it was decided not to employ the creativity potential of an age group as a basis for the selection of the sample, but rather to rely on a classroom situation which would indicate a common background of art experience for the students.

In order to keep the teaching factor constant, the same teacher

⁹Robert Henkes, "Nature--sole source of motivation," School Arts, LXV (November, 1965), 33-35.

¹⁰Earl Linderman, "Curriculum for Awareness," Art Education, XVII (June, 1964), 5-9.

¹¹Norma Trowbridge, "The Creativity of Children in Art Classes" (unpublished Doctoral dissertation, Iowa State University, 1964).

¹²Clarence Kincaid, "The Determination and Description of various Creative Attributes of Children," Creativity and Art Education, ed. W. L. Brittain (Washington: NAEA publication, 1964), pp. 108-115.

administered all four programmes. In doing so it was recognized that the instructor might tend to favour one group at the expense of the others because of unconscious personal bias. Again associated contemporary research is divided on this point; Frankston¹³ feels that teaching strategy does not affect student work, while Doerter's¹⁴ study has produced findings which indicate that it does. Under the circumstances, contamination of the results was considered less likely if all four treatments were administered by one teacher who had been made aware of the difficulty and was therefore forearmed against it, rather than by four separate instructors. As an additional safeguard, randomly selected results on the first assignment (the pre-test) were compared with results from the final assignment (the post-test) to ascertain whether any noticeable shift in student strategy had occurred.

Another possible source of distortion concerned the management of time allotted for explanation of procedures and discussion of subject matter during any one period. It was decided that the amount of time given to such "warm-up" activities be left flexible, as is the case in any normal school art situation. In any event it was not anticipated that students in the population employed would be so unfamiliar with the

¹³Leon Frankston, "Effects of Two Programs and Two Methods of Teaching upon the Quality of Art Products of Adolescents," University Park: Penn. State U., U.S. Office of Education, Cooperative research project No. S-155, 1964-65, p. 24.

¹⁴James Doerter, "Influence of College Art Instructors upon their Students' Painting Styles" (Doctoral dissertation, Pennsylvania State University, 1962).

range of media provided for the experiment as to require time-consuming operating instructions.

Research by Burkhardt¹⁵ has suggested that at least ten art lessons are necessary in order for the effects of a particular treatment to become apparent. A series of ten lessons, summarized in Appendices B1 and B2, was therefore drawn up for each group.

¹⁵R. C. Burkhardt, "Evaluation of learning in Art," Art Education, XVIII (April, 1965), 3-5.

CHAPTER II

A REVIEW OF LITERATURE AND RELATED RESEARCH

This chapter is concerned with a review of research and literature related both to the general context and to certain specific aspects of the experiment undertaken. The material falls under four sub-headings: the first deals with a general overview of the conduct of art programmes insofar as the freedom of the subjects to direct the course of their studies is concerned; the second focusses on specific theories and experiments dealing with what is broadly termed the imposition of restrictions, in the sense in which that phrase is defined by the writer for the purposes of this study; the third covers research in the establishment of differential criteria for the objective evaluation of art works; and the fourth relates to the effects of teacher working strategy on student working strategy.

General Overview of Literature concerning Freedom of Choice within Art Education Practice

Frederick Logan,¹⁶ in tracing the development of art in American schools, summed up the prevalent approach to art in the mid-nineteenth century school when he stated that for the intellectual community of that time the worth of pictorial art was judged by the measure of the accuracy with which the subject was delineated. Thus, a rigorous training

¹⁶Frederick Logan, The Growth of Art in American Schools (New York: Harper, 1955).

in art, employing much copying of linear forms, was looked on with approval.¹⁷ Authorities such as Walter Smith¹⁸ of Boston, Mass. therefore presented young school children with problems to solve which reflect this encompassing desire for accuracy.

Media were likewise restricted, mostly to pencils. But in the early 1900s certain teachers began to explore the possibilities of enlarging the number of media to be used. Logan mentions that:

A phase often dwelt upon was that of media used in drawing, and here there was some confusion. Generally writers were still sure that pencils and line drawings were most acceptable to children and most useful in portraying their ideas. Occasionally though, there were teachers who began to urge the use of larger drawings, of paint and wider use of colour.¹⁹

A spiritual revolution came about during the 1930s as a result of the influence of the Bauhaus--an influence still directly felt on the North American continent by the presence of Walter Gropius, Mies van der Rohe and Josef Albers, and by the pervasive agency of the Chicago Institute of Design, which had as its director Moholy-Nagy, formerly of the Bauhaus staff.

The principle underlying Bauhaus practice was flexibility. "The Bauhaus curriculum ... was a rather haphazard affair, changing as new ideas turned up and special talents asserted themselves".²⁰ Students

¹⁷Ibid., pp. 23-24.

¹⁸Walter Smith, Teachers' Manual of Freehand Drawing and Designing and Guide to Self-Instruction (Boston, 1873).

¹⁹Logan, op. cit., p. 123.

²⁰Wolf von Eckhardt, "The Bauhaus," Horizon, IV (November, 1961), 64.

were asked to "forget all they had ever learned about art and ... discover their own spontaneous impulses and develop their sense of touch, colour, and space".²¹ In this way these students, many of whom became during the pre- and post-World War II period the leaders and directors of art education both in Europe and in North America, argued the case for the introduction of a wide variety of materials into the school art programme with proselytising zeal, so that almost thirty years after the Bauhaus in Dessau was closed Laura Chapman was moved to write on the art programme she had planned as a novice teacher:

The plan I presented was centred on the notion that children ought to use many and unusual materials. Almost by chance, it seems I was confronted with the fact that my conception about what children ought to do was based on some knowledge that artists in the Dada and Bauhaus movements had sanctioned using many new materials for artistic ends ... Later I was able to see that my desire for choice among media in my studio grew out of the warmed over Bauhaus tradition fostered in the college art courses I had taken.²²

But by the time the 40th National Society for the Study of Education yearbook,²³ devoted on that occasion to art education, was published, the pendulum had begun its return swing. Part of the credit for initiating the change must go to Sir Herbert Read, whose visualization

²¹von Eckhardt, loc. cit.

²²Laura Chapman, "Becoming and Being a Teacher of Art," Art Education, XVI (October, 1963), 18.

²³Art in American Life and Education; the Fortieth Yearbook of the National Society for the Study of Education, ed. Whipple (Bloomington, Illinois: Public School Publishing Co., 1941).

of education as a vehicle for "the creation of artists--of people efficient in the various modes of expression,"²⁴ is echoed in an article by Whitford²⁵ in that yearbook. Whitford stated that art education in the lower grades was being carried on through units of experience, the aims of which were to give students increased knowledge, appreciations, and skills. In the upper grades more specialization was developed through units which provided technical information as well as opportunity for creativity.

More recently the advisability of using variety of media as the criterion for efficacy in the school art programme has been called into question by educators such as Manuel Barkan²⁶ and Herbert Burgart.²⁷

Writing in Art Education recently, Barkan stated:

I don't think I am overstating the case by saying that a great many art teachers judge the effectiveness of their teaching in terms of the number of different media they include. The more the media they provide, the better they think they are teaching; the more varieties of media their children experience, the better they assume the learning to be.²⁸

²⁴Herbert Read, Education through Art (revised edition; London: Faber and Faber, 1958), p. 11.

²⁵William Whitford, "Some Present and Recommended Practices in School Art," N.S.S.E. Yearbook (Bloomington: Public School Publishing Co., 1941), pp. 460-462.

²⁶Manuel Barkan, op. cit., 12-18, 27.

²⁷Herbert Burgart, "Towards a New Art," School Arts, LXV (October, 1965), 6-9.

²⁸Barkan, op. cit., p. 16.

He goes on to say:

Just as it is not necessary, and in fact is a hindrance, for children to accumulate a huge vocabulary before they even try to write a story, so it is a hindrance if children collect knowledge through haphazard experiences with many different media before settling down to the serious business of behaving like artists.²⁹

Burgart pleads something of the same case in calling for the institution of depth programmes at the elementary school level, emphasizing that by "depth" he means a total experience in art in which related fields are brought in as they contribute meaningfully to the main experience.³⁰

To summarize, it would appear that school children have passed from an era in which drastic limitation was placed both on the subject matter and media which might be used in art activities, through a period of artistic anomie in which few limits were placed on either materials or experiences, and thence into the present phase wherein the emphasis is on qualitative handling of a limited number of materials in an attempt to give students experiences similar to those of an artist. The influence of Jerome Bruner's³¹ "structure" theories is apparent in the contemporary advocacy of approaches which encourage the student to act at his level in the same manner as a researcher, so that differences occur in the level of development rather than in the attitude taken to the problem.

²⁹Ibid., p. 18.

³⁰Burgart, op. cit., 8.

³¹Jerome Bruner, The Process of Education (Cambridge: Harvard University Press, 1965), pp. 6-8.

Recent Theories and Experiments Dealing with the Imposition of Restrictions

Eisner's "Paradigm for the Analysis of Visual Problem Solving"³² attempts to examine the question of varying levels of control through two factors--imposed conditions and cues. He explains that by imposed conditions he means the demands and prohibitions exercised upon the class by the teacher, and by cues he means ideas formulated by students from teacher stimuli, which they convert into ideas for expression.

The paradigm is drawn up as follows:

Project given	Project given	Project given	Project given	Problem given	Conceiving problem
Media given	Media given	Media given			
Method given	Method given				
Technique given					
Criteria for evaluation given					

He suggests that to think of the relationship of imposed conditions and cues as an either/or arrangement is to over-simplify what is in fact a complex interaction. There may be cases, for instance, in which the teacher's impositions benefit the student, since these very restrictions may help the student to focus more sharply on those aspects of the problem which are relevant. By so focussing, however, both student and teacher have to

³²Elliot Eisner, "A Paradigm for the Analysis of Visual Problem Solving," Studies in Art Education, III(1), 1961, 47-54.

sacrifice a certain amount. The student is required to work within these limits, and the teacher is unable to determine whether or not the student could have solved the problem in an alternative and possibly more creative manner. The educator or curriculum adviser is therefore continually faced with the dilemma of choosing whether to advise operating for a long period in a narrow field or extending the range of learning at the expense of intensive study.

One of the earliest attempts to focus upon the effects of "breadth" versus "depth" treatments on a student population was described in the Mattil³³ study, published in 1961. His definition of a "depth" programme was one "which allows a sustained long term concentration on one specific area of study. There may be a variety within this area but the different activities are such that they permit an easy transition from one problem to another" A "breadth" programme included "a wide variety of well chosen subjects and activities ... dispersed in such a way as to accommodate differences in the interests and experiences of the pupils"

Three groups were used, all drawn from grade nine classes in a Pennsylvania city school. One group, having been randomly selected for this role, was designated as a control class and taught exactly according to the previous year's course of study. The "breadth" group was taught from a special programme drawn up to include a variety of topics and activities; while the "depth" group was taught intensively via painting assignments and related topics. The entire experiment occupied the period

³³Edward Mattil, "The Effect of a 'Depth' vs. a 'Breadth' Method of Art Instruction at the Ninth Grade Level," Studies in Art Education, III (1), 1961, 75-87.

October through May, during which all classes were taught by one teacher, and all works were evaluated by expert art judges. Their findings confirmed the hypothesis that the "depth" approach was superior to the "breadth" approach, and that both approaches were superior to that adopted by the control group, as measured by progress in spontaneity, aesthetic quality, and related creative personality dimensions. "t" tests on analysis of mean gains revealed that the "depth" group was superior to the "control" group in four out of four comparisons, and that the "breadth" group was superior to the "control" group on one out of four comparisons. According to factor analysis of judge scores, Art Quality is associated with Spontaneity and Aesthetic Quality, two factors which correlated .693 (.01 level of significance). Both these factors, according to Mattil's definition, must be present if progress is to occur.

Subsequent differences of opinion among authorities³⁴ on the adequacy of considering spontaneity as the sole index of creative potential have resulted in a certain reservation on the part of the writer towards accepting these findings.

It is interesting to note in Mattil's study that from an analysis of pre-tests and post-tests of personality structure "there is significant decline in interest in new and different theories, ideas, and experiences,

³⁴Laura Chapman, "Some comments on 'Spontaneous, Divergent, and Academic Art Students'," Studies in Art Education, VI (1), 1964, 25-29.

and a drift toward a more factual viewpoint for students as a whole."³⁵ Depth group losses were not significant (no level of significance is mentioned) but losses in mean scores were significant in the case of the two other groups. One wonders therefore whether the format of the "depth" programme, concentrating as it did in one field, was not conducive on the part of those students who undertook it to a certain feeling of stability which was, by the varied nature of the material, lacking in the "breadth" group.

Raymond Brose's study³⁶ was planned around the hypothesis that there would be a difference in performance between two drawing classes, one using varied media, the other limited media, the difference appearing in favour of the varied media class. 884 drawings by fifty-two college students, collected from nine assignments, were evaluated by three expert judges using a three-point rating scale. Reliability was determined by re-test judging for intra- and inter-judge agreement. His findings indicated that the class using varied media was superior in light and shade and in figure drawing at the .001 level of significance, and in drawing the human head at the .05 level. Otherwise no statistically significant differences were revealed, although results favoured the varied media group.

The effects of a prescribed approach were compared with those in

³⁵Mattil, op. cit., p. 83.

³⁶Raymond Brose, "Performance in Drawing as related to the Use of Limited versus Varied Media" (Unpublished Doctoral dissertation, Stanford University, 1960).

which the programme was self-developed in a recent research project conducted by Frankston.³⁷ Approximately sixty adolescent subjects were involved over periods totalling eighteen hours, and teachers were drawn from college students displaying definite traits either of a Spontaneous or of a Divergent approach to problem solving activity.

Among the findings of the study it was revealed that in the case of the prescribed programme teachers had difficulty in following the programme; the teacher displaying Divergent strategy tried with only limited success to follow the programme, while the Spontaneous teacher adjusted by omitting parts of the outlined activities.

Those teachers who followed a self-directed programme, on the other hand, found that they were able not only to manipulate activities to suit immediate interests, but also to engage actively the cooperation of their students, who participated in discussion of the programme's direction. In his conclusions Frankston suggests that a self-developed course of study is better for the Spontaneous teacher than for the Divergent teacher, and proposes the relation of the content of the programme to the method of the teacher.

The inclusion of the Kendrick study³⁸ in this section is felt to be merited because it deals with two aspects of control which were present

³⁷Frankston, op. cit.

³⁸Vernon Kendrick, "The Influence of Repetition on the Overall Aesthetic Quality and the Completion Time of a Creative Art Task" (Doctoral Dissertation, Pennsylvania State University, 1960).

in the writer's experimental programme, though no attempt was made in the course of that programme to study those aspects intensively. Kendrick was concerned with the influence which repetition of a task might have on the overall aesthetic quality of each successive product, and also with the variation in time taken to complete a succession of projects. Six groups of college students were asked to repeat on several occasions a creative task using twenty-four pieces of pre-cut construction paper, the time interval between repetitions varying from group to group (one, seven, fourteen, twenty-eight, forty-nine, and ninety-eight days respectively). Analysis showed that the most creative students improved the aesthetic quality of the product between the initial experience and the first repetition, but the subsequent repetitions failed to reveal further increase. Groups with smaller intervals of time between projects made greater mean gains, but there was no significant overall gain between the initial and final experience. The time taken to complete the art task decreased in a straight line drop with a levelling off for the last repetition.

Since it was noted by observation of all four groups participating in the writer's own study that the time taken to complete each lesson did not seem to vary materially from one group to another, it was conjectured that Groups One and Three, though both restricted for the purposes of the experiment in subject matter choice, were not viewing their task as one involving repetition per se, but were rather finding opportunity to apply creative exercise to the subject matter.

Research in the Establishment of Objective Evaluation Criteria

In attempting to evaluate a particular art product, the individual is naturally tempted to make a judgment on its appeal based on a simultaneous consideration of those factors which made up the content of the work. Such a gestalt judgment has its limitations however in that subject matter, formal elements, or expressive/symbolic factors may exercise various effects on the judges so that there is a likelihood of inconsistency in the score assigned to the product. In an experiment conducted by Beittel and Brittain³⁹ judgments on a group who each created a series of three works were effected by (1) an overall appraisal of aesthetic quality compared with others in the group, (2) an overall appraisal of the degree of creativity of all three projects, and (3) an overall appraisal of the aesthetic quality of all three projects. Yet both "overall appraisal of aesthetic quality" and "overall appraisal of the degree of creativity" are terms of such indeterminate and ambiguous reference that the possibility of communicating to others just what one is looking for becomes a task of infinite complexity.

Publication in 1962 of Burkhart's Spontaneous and Deliberate Ways of Learning⁴⁰ revealed a new approach to evaluation, however. Burkhart proposed the division of students into two categories based on working strategies which he termed "Spontaneous" and "Deliberate". The Spontaneous

³⁹W. L. Brittain and K. R. Beittel, "Analyses of Levels of Creative Performance in the Visual Arts," Journal of Aesthetics and Art Criticism, XIX (1960), 83-90.

⁴⁰R. C. Burkhart, Spontaneous and Deliberate Ways of Learning, (Scranton: International Textbook Co.), 1962.

student, at the lowest level of a continuum possessed "an emotional orientation which is so centered in the moods of the self that the entire dimension of self-awareness which comes from perceiving others' reactions to one's self is crowded out of existence."⁴¹ At the same time the Spontaneous individual reveals more potential for creativity than does the Deliberate student, whose work is pre-conceived and executed in a step-by-step impersonal manner.

This Deliberate orientation in art stems, according to several studies of the various attitudes of Deliberate students, from their concrete, literal, emotionally non-committal, ideationally closed and security-orientated personality structures. Furthermore the relationship of the Deliberate students to the teachers in the classroom and to their peers is essentially adaptive, non-interactive, and often other-directed.⁴²

From a visual scale comprising thirty-two drawings and paintings developed from appraisal by several hundred judges and employing over 5000 student works in the course of its formulation, the following attributes for Spontaneous and Deliberate students were evolved---

⁴¹Ibid., p. 4.

⁴²Ibid., p. 3.

SpontaneousDeliberate

Blurred or rough contours
 Active or dynamic handling
 Bold or rugged surfaces
 Loose and free form
 Variety in use of detail
 Flexibility in the treatment
 of the whole
 Functional use of the white
 of the paper

Sharp or clean contours
 Static or clean contours
 Redefined or polished surfaces
 Tight or restricted forms
 Repetition in use of details
 Rigidity in the treatment
 of the whole
 Full coverage of the paper
 surface

Also included in this work is a scale for Analytical Visual-Verbal Judgments. Analytical judgments determine in precise form the content of a gestalt judgment. The analytical features selected by Burkhart included variety, exaggeration, dramatic contrast, simplicity/complexity, gradation of values, non-spatial/spatial, variety in pattern, and organizational unity. Each of these was illustrated through four stages, as for instance under "Variety"; almost none, some, more, much.

Burkhart also refers to an eight-point scale developed by Gogel which was constructed from selected sections cut from animal and human figure drawings reorientated to emphasize lines rather than specific content. The aim of this scale was the same as that developed by Burkhart--the possibility of separating Spontaneous and Deliberate student working strategies.

A statement that "the Spontaneous group as a whole, and particularly the high students, desire situations and tasks which will permit them to think in a Divergent manner, and the Deliberate students, both high and low, desire to avoid the uncertainties of creative problems,"⁴³

⁴³Ibid., p. 67.

had repercussions during the following year, when Beittel and Burkhart published an article entitled "Strategies of Spontaneous, Divergent, and Academic Art Students."⁴⁴ The authors pointed out that in the course of their investigations on Spontaneous and Deliberate strategies they had become aware of a third approach, which they termed "Divergent". The Divergent student, it was claimed, varied the goal rather than the procedure, his emphasis being on discovery rather than on problem-solving. Whereas the Spontaneous student delighted in freedom from restriction, the Divergent student found satisfaction in the control he was able to exercise over medium or process. The Academic student favoured the Deliberate pattern of working through a known technique towards a known goal, seeking satisfaction from external sources. Indeed it is the writer's impression that he appears to enjoy no very high degree of esteem in the hierarchic pattern of art strategies.

Further research conducted by Gloria Bernheim⁴⁵ led her to a reformulation of the above strategies into three domains: the Spontaneous, the Formal and the Divergent. Following an initial assessment of paintings to look for criteria which would be (1) assessable in terms of art product alone, (2) immediately understandable to the judge, and (3) applicable to any sample of two dimensional art product, no matter what the medium, she

⁴⁴K. R. Beittel and R.C. Burkhart, "Strategies of Spontaneous, Divergent, and Academic Art Students," Studies in Art Education, V (1), 20-41.

⁴⁵Gloria Bernheim, "The Dimensionality of Differential Criteria in the Art Product: an Empirical Study," Studies in Art Education, VI (1), 1964, 31-48.

selected six criterion elements for Spontaneity judgment. These were:

- Detail--loose to meticulous
- Media overlap--(of qualities of brushwork etc.)
- Border of shapes--ragged to smooth
- Textural effects--artist/media interaction to mechanical
- Movement within shapes
- Objects--moving to still

Those comprising the Formal-intellectual, or more simply the Formal domain were:

- Overlap-transparency
- Progressive abstraction
- Connectedness
- Three dimensionality
- Dominance/subordination

The criteria for the Divergent domain were:

- Alteration of viewpoints
- Rearrangements (Not including new objects)
- Alteration of treatment
- New objects

Judges were then asked to evaluate a set of twenty-four drawings, all done in the same medium and as the result of a common task. Each of the above elements was considered separately by the judges and a one to five rating was assigned. It was hypothesized that the elements associated with a particular strategy would correlate highly with each other, but would fail to achieve any significant degree of correlation with those of other domains.

Intercorrelations showed that within the Spontaneous domain all correlations were significant at the .01 level, with the criterion "Objects: moving to still" being the weakest element. It was therefore felt that all Spontaneity elements seemed to function together as a domain.

The Formal domain showed much weaker results, particularly in "Three-dimensionality" and in "Dominance/subordination," while the

Divergent domain yielded a highly positive correlation only in respect to "Alteration of viewpoints" and "Rearrangement of objects". On the basis of these and similar findings, revised criteria were drawn up as follows:

Spontaneous criteria: No change

Formal criteria: Overlap/transparency, Progressive abstraction, and Connectedness. ("Three-dimensionality" is dropped completely and "Dominance/subordination" is moved into the Divergent domain)

Divergent criteria: Dominance/subordination, Alteration of viewpoints, Rearrangement ("Alteration of treatment" and "New Objects" are dropped completely)

The value of this study, in Bernheim's words:

"... is unquestionable. Without having accomplished this task, we would have no means by which to study or measure growth due to treatments. With the use of Differential Criteria, it is possible to see specifically what growth or learning means in the art product and to find out what personality factors or predispositions are related to specific kinds of learning."⁴⁶

From these studies it becomes apparent that not only do several art educators feel that it is possible to isolate the elements in an art work independent of any global appreciation of content, but that it is possible to evaluate progress and strategy in terms of specific criteria, providing that judges are made aware of the criteria on which it is desired to concentrate. It may be, therefore, feasible to teach towards the development of specific features covered by the criteria, and a consideration of this leads us to conflicting evidence on the extent to which teacher strategy (ie. the essentially Spontaneous, Divergent, or Formal-academic approach which a teacher adopts) affects student strategy.

⁴⁶Ibid., p. 47.

The effects of teacher working strategy on student working strategy

Two major reports have been made recently on the extent of the influence which teacher working strategy has upon student working strategy. In the case of the Frankston⁴⁷ study, the question is examined within the classifications developed by Beittel and Burkhart; that is, in terms of "Spontaneous" and "Divergent" strategies.

Using children's art classes held on the Pennsylvania State University campus on Saturday mornings, Frankston set up four matched groups which were instructed for a total of eighteen hours over nine weeks by four university students previously identified as showing definite evidence of Spontaneous or Divergent characteristics. Two groups were taught by Divergent student-teachers, each of whom was accompanied by a student observer of similar working strategy; two groups were taught by Spontaneous student-teachers who were likewise observed. A further subdivision was arranged by having one of the two teachers from each strategy pattern conduct a series of lessons prescribed by Frankston, while the other teacher followed a self-developed programme.

In an analysis of variance based on the results of three tests (two still lifes and a figure study) only two strategy variables showed significant "F" ratios, and these were in fact related to content rather than to strategy. Since only one of the three tests resulted in significant differences, Frankston felt that it might be unwise to draw any definite conclusions from this evidence, but went on to state that the

⁴⁷Frankston, op. cit.

direction which the results took indicated that strategies of teachers do not influence and affect student strategies.

A possible explanation for some of the inconclusiveness associated with this aspect of the results may lie in his account of the programme followed by the "self-developing" groups.

The two teachers who followed a self-developed art program indicated that they were influenced, in planning their lessons from week to week, by the interests and needs of the students in their respective groups ... Although the self-developed courses of study were developed by two teachers who supposedly were of different strategies, the program which they made up from week to week showed a similar pattern ... ⁴⁸

Although he goes on to say that there was a real difference in the way the teachers with Spontaneous and Divergent strategies handled their classes, the writer feels that the fact that class-members helped to shape the course of the self-developed programmes might well have had a contaminating influence on the final form in which each lesson was presented.

The similarity of the self-developed programmes may also be the result of teaching skills and methodology acquired via the common course of studies in which the instructors were currently concerned. For this reason it is especially interesting to compare Frankston's findings with those of James Doerter, whose study enquired into the influence of state college and university instructors on the painting styles of their students.⁴⁹ His major hypothesis was that there is no relationship between the painting style of instructors and students as manifested in

⁴⁸Ibid., p. 11.

⁴⁹Doerter, op. cit.

student art work completed over a one semester period. Doerter designed two instruments: (1) a nine category style continuum encompassing painting styles from naturalistic interpretation to abstract-expressionism, and (2) an instrument designed to determine whether five judges could, by looking at instructors' paintings, correctly identify those classes from which a student painting had come.

As a sample, eight students were randomly selected from each of five painting classes. It was agreed by all instructors that the students had not been limited during the semester in choice of subject or in their manner of expressing subject-matter, yet the percentage of total movement towards the instructors' style was between 73 percent and 97 percent over the five classes. Similarly, identification of students of four out of the five instructors was possible at the .01 level of confidence. The investigator therefore concluded that the evidence pointed to a definite influence by instructors on the painting styles of their students, without any conscious manipulation on the part of the instructors. He offers as a recommendation that "perhaps the strong ego, needed to support and sustain creative individuals and instructors, must soften during instructional periods, allowing diversity of student style and expression."⁵⁰

Summary of the Review of Literature

An overview of the history of art education in North America has revealed the influence of philosophers, artists, and educators in the

⁵⁰Ibid., p. 102.

shaping of the art programme taught in schools. Present trends are difficult to summarize as an entity, since they appear to involve considerable overlapping of ideas. What seems to have emerged, however, is a rough amalgam in which are combined the freedom to express ideas, and the disciplined uncovering of experiences.

Certain authorities have been quoted as proposing that in every classroom situation there exists a system of restrictions imposed by administrative and procedural requirements, and that the extent to which these requirements are implemented constitutes what have been termed "depth" and "breadth" treatments. Several studies devoted to the "depth versus breadth" question were discussed.

Concurrent with the interest in "depth" and "breadth" treatments has been the desire of several researchers to isolate certain working patterns into categories which might be, in turn, identified by certain features of the art work itself. Research in this area uncovered two types of working strategy, termed Spontaneous and Deliberate, which were subsequently regrouped into Spontaneous, Divergent, and Formal strategies. Characteristics identified with these strategies were used by the writer as bases for the criteria developed to meet the needs of this study.

The identification of working strategies inevitably led some researchers to enquire about the possibility of a transfer of working strategy characteristics occurring, particularly in a classroom situation, where the instructor's influence is presumably strong. In the course of the chapter mention was made of research directed towards the investigation of such a contingency.

This chapter has attempted to establish the general direction in

which art education has been moving as far as the implementation of aims in classroom procedure is concerned, and in particular has concentrated on recent experimental research in structured art situations and in product evaluation.

CHAPTER III

CONDUCT OF THE STUDY

Setting of the Study

The experiment took place within the Edmonton Public School system, in a large composite high school, during the first two weeks of May, 1966. All four participating classes, comprising four units in the Art Ten (elective) programme, were scheduled for one forty-five minute period per day. Each class completed ten lessons over ten school days.

Population Employed in the Study

Classes were made up of students of both sexes, ranging in age between fifteen and eighteen years. In all, sixty-three students engaged in the project.

Preparation and Collection of Materials Employed in the Classroom

Treatments

The theme "Nature" was chosen as one around which to structure two series of eight lessons designed to focus on one or more of the following factors: variety within shapes; connectedness and organizational unity; rearrangement; the exercise of imagination in terms of dramatic effects and exaggeration; the use of texture; gradation of tonal values; and variety between shapes combined with the use of dominant and subordinate shapes.

A selection of slides was made up which featured various aspects of nature-- microphotographs of plants, textured surfaces of rocks,

cloud patterns; and works both by children and mature artists--Moore, Giacometti, Dali--which related to the problems drawn up for the students. In addition, some thirty photographs taken from periodicals and magazines were dry-mounted on cardboard; the content of these photographs again related directly to nature, or revealed how natural forms had been adapted and transformed by artists.

Materials for the five still lifes which provided subject matter for the pre- and post-tests were obtained locally. These still lifes were arranged and numbered immediately prior to the commencement of the experimental period.

A supply of 18" x 24" manila paper sufficient for all groups was made available.

Procedure

Classes were randomly assigned the treatments outlined in Figure 1. Members of each class were informed that they would be participating in an experimental programme lasting for two weeks in which they would be asked to attempt one drawing per day on the basis of certain motivation provided by the instructor. For the first project, however, (the pre-test) no advice or direction would be given. Students in non-restricted subject matter groups (Groups Two and Four) were then told they might choose any one of four still lifes and in the course of the period complete a drawing of it. Photographs of these four still lifes appear, numbered One to Four, in Appendix C1. Those students belonging to non-restricted media groups (Groups Three and Four) were advised that they might choose from any one of five media:

MEDIUM	SUBJECT MATTER		TREATMENT GROUPS
RESTRICTED	RESTRICTED	Group One:	Restricted both in media choice and subject choice N = 13
	UNRESTRICTED	Group Two:	Restricted in media choice, unrestricted in subject choice N = 18
UNRESTRICTED	RESTRICTED	Group Three:	Unrestricted in media choice, restricted in subject choice N = 13
	UNRESTRICTED	Group Four:	Unrestricted both in media choice and subject choice. N = 19

FIGURE 1

BREAKDOWN OF GROUPS AND ASSIGNED TREATMENTS

pencil, conte, charcoal, india ink, and black tempera paint; or that they might use a combination of these media. Students in restricted subject matter groups (Groups One and Three) were told that they might draw only one still life, the rock and branch, designated number Five in Appendix C1; those in the restricted media groups (Groups One and Two) were told they might use only charcoal for the entire series of lessons.

Following this initial experience, students in the non-restricted subject matter groups followed the series of lessons set out in Appendix A2, and had no further contact with the still lifes until the post-test (Lesson Ten) was administered. Still life number Five was retained for daily use by the students in the restricted subject matter groups. The sequence of activities which they followed is outlined in Appendix B1.

Lesson Ten (the post-test) was presented in a manner similar to that employed in Lesson One. Students in unrestricted subject matter groups were once again confronted with the still lifes numbered One to Four and were told they might choose any one to draw. No advice or direction would be given, however, in the course of this final lesson. Conditions similar to those prevailing during the pre-test were also maintained for the students in restricted subject matter groups. Restriction and non-restriction in media were identical with those imposed for the pre-test and for the interim lessons.

Progress evaluation and Self-assessment Questionnaires

Three main reasons underlay the decision to ask participating students to complete two identical questionnaires in the course of the two week period of instruction. First, it was felt that students would thereby have an opportunity to record their reactions to the particular media/subject matter combination which they were asked to use. Secondly, it would afford a basis for a comparison of sentiments or opinions expressed during the first week with those formulated during the second. Thirdly, it would provide an insight into the group reaction pattern so that certain conjectures might be made about the relative merits and disadvantages of each programme which could, in turn, corroborate or have relevance to the main findings of the study.

In the light of what researchers have had to say on the dependability of children's self-ratings⁵¹ it was determined to keep this aspect of the study at a visual/descriptive level rather than subject the data to statistical analysis. Nevertheless several interesting facts emerged; these are discussed in the chapter dealing with the analysis of data. A copy of the questionnaire is to be found in Appendix E. As previously stated the same questionnaire was given out on two occasions; the first following Lesson Four during the first week of instruction, and the second following Lesson Eight during the second week. Because of student absences, forgetfulness, et cetera, the

⁵¹Marguerite Lienard, "What is the relationship of children's satisfaction with their art products to improvement in art," Studies in Art Education, III (1), 1961, 55-65.

number of students who filled out both questionnaires does not correspond with the number of students whose works are analysed in the main study. It should also be noted that Question Seven, dealing with freedom of choice, was inserted for Groups Two and Four only in the second questionnaires after certain points raised in class had hinted at possible failure on the part of the students to recognize that opportunity for choice within their treatments was present.

Summary of Experimental Procedure

Four Art 10 classes in a city high school were randomly assigned experimental treatments which imposed varying degrees of restriction upon their handling of a series of ten lessons, the first and last of which served as a pre-test and post-test respectively, thus providing material for analysis and comparison. All classes also completed two identical questionnaires, subsequent to Lessons Three and Eight, so that some assessment might be made of student reaction to the project.

Reproductions of some of the work produced by students in the course of the study may be found in Appendices C2, C3, and C4.

TABLE I

CHOICES MADE IN MEDIA AND SUBJECT MATTER BY STUDENTS IN
UNRESTRICTED GROUPS

I. Numbers of students choosing to work in each available medium

Group	Test	MEDIA CHOICE					
		Charcoal	Conte	Pencil	Ink	Tempera	Mixed Media
3	Pre	3	0	4	1	0	6
	Post	1	5	3	1	0	3
4	Pre	4	2	14	0	0	1
	Post	3	7	4	4	0	1

II. Numbers of students choosing to work on each of the four still lifes

Group	Test	STILL LIFE CHOICE			
		1	2	3	4
2	Pre	14	1	3	5
	Post	13	1	4	0

Number of Group Two students choosing
a different still life in post test
from that chosen in pre-test

8 44%

Group	Test	STILL LIFE CHOICE			
		1	2	3	4
4	Pre	9	1	6	5
	Post	10	2	6	1

Number of Group Four students choosing
a different still life in post-test
from that chosen in pre-test

14 78%

CHAPTER IV

COLLECTION OF DATA AND DESCRIPTION OF STATISTICAL PROCEDURES

Establishment of the Evaluative Instrument

Using criteria developed by contemporary art education researchers⁵¹ a score card was drawn up for the use of six expert art judges in evaluating the drawings produced in the pre-test and post-test lessons. The score card is reproduced as Figure 2.

The criterion "Dominance/subordination" has been combined with "Variety between shapes", since in those works featuring only the rock and the branch the use of dominance and subordination was limited by the nature of the subject matter.

Scores were assigned on a scale of from one to five points, the bases for each rating being:

- a) Minimal evidence (Evidence of the factor is completely lacking or is present in a negligible form)-----Score 1
- b) Slight evidence (Recognizable as the factor but underdeveloped)-----Score 2
- c) Definite evidence (Factor is present and has been employed sufficiently to display meaningfully its characteristic features)-----Score 3
- d) High degree of development (Factor has been used to advantage: there is evidence of complexity)-----Score 4
- e) Very high degree of development (Factor has been thoroughly exploited; there is evidence of a high degree of realization of how the factor can best be used)-----Score 5

⁵¹See pp. 25-30.

Judge No. _____	Group _____	Score
Work No. _____	Pre/post _____	
Variety within shapes		
Connectedness and organizational unity		
Rearrangement		
Imagination--drama		
Imagination--exaggeration		
Use of texture		
Gradation of values		
Dominance/subordination; variety between shapes		

FIGURE 2

SCORE CARD EMPLOYED BY JUDGES

Identity of Judges

The six judges who were asked to undertake the evaluation of art works comprised two associate professors in Fine Arts at the University of Alberta; one assistant professor in Art Education from the same institution; two graduate students in Art Education, also from the University of Alberta; and the Art Supervisor for the Edmonton Public School System.

Scoring Procedure for Pre- and Post-Test Art Works

All works were randomized and spread out on tables in three large rooms. Each judge was issued with a clip board containing a number of score cards, and a copy of the rating scale which included the bases for rating drawn up by the researcher. Each of the criteria was explained by the researcher, and judges were asked to walk round all the works to gain a general impression before settling down to judging individual works. Judges were also encouraged to begin evaluating the works at different points so that no one group of works either benefitted or was harmed by initial ratings. After five or six drawings had been scored, the researcher asked for questions on matters requiring clarification; following which the judges had an opportunity to re-assess their scores, if necessary, and then continue.

Reliability of Obtained Scores

Justification of the Use of Expert Art Judges to Evaluate Student Work. Frankston points out that "it is clearly possible to reliably measure art products for certain criteria by employing judge-experts and providing them with (1) a 'products scale,' (2) a definition of the

judged criteria, and (3) an opportunity to take part in a 'training session'."⁵² Gordon has said:

Use of student paintings has the advantages of presenting a wide range of talent, and of avoiding the influence of prestige factors which would affect the ratings of important works of known artists. No disadvantage is suffered in using imperfect paintings; there is no apparent reason why an excellent criticism may not be made of a non-excellent painting. We may expect that the factors making for excellence or faultiness will stand out clearly in such paintings.⁵³

Inter-judge reliability. The average time taken by each judge to evaluate all the drawings was approximately three hours. On completion of the judging, score-cards were collected and Pearson product-moment correlations were computed between judges' ratings on each criterion. The matrices of these intercorrelations appear as Appendix F.

The intercorrelations varied considerably from one criterion to another. The decision on whether to accept or reject these results or whether to entertain certain reservations on their reliability, called for a consideration of various circumstances which might have influenced the judges. As Guilford has pointed out:

Considerations external to the data themselves should be given weight. There may be serious theoretical or practical reasons why it would be costly to make one kind of error or the other. Thus the odds, ultimately, cannot be decided on statistical grounds. Once the non-statistical issues have been evaluated, however, the statistical standards can be more easily adopted.⁵⁴

It should be noted that though all judges had a considerable background of art knowledge, in all except one case this was their first

⁵²Frankston, op. cit., pp. 23-24.

⁵³D. Gordon, "Methodology in the Study of Art Evaluation," Journal of Aesthetics and Art Criticism, X, 1952, 340.

⁵⁴J. P. Guilford, Fundamental Statistics in Psychology and Education, (Toronto: McGraw-Hill, 1956), p. 216.

TABLE II

LOWEST, MEDIAN, AND HIGHEST OBTAINED INTER-JUDGE
CORRELATIONS ON EACH CRITERION

Criterion	Lowest	Correlation Median	Highest
1	.36	.54	.61
2	.33	.42	.58
3	.12**	.35	.52
4	.31*	.46	.64
5	.18**	.36	.58
6	.52	.62	.72
7	.43	.59	.72
8	.13**	.38	.50

Based on two tailed test of significance (df:62)

** $\leq .05$ level of significance

* $\leq .01$ level of significance

Criteria 1 to 8 are detailed in Figure 2 on Page 44.

experience with score-cards of this nature. Furthermore, the emphasis upon certain visible aspects of the work rather than upon the more usual overall gestalt judgment, to which they were all accustomed, may have presented them with some difficulty in adjusting to a parsimonious attitude.

Separate intercorrelations were run on the computer for pre-test and for post-test judged scores in addition to the intercorrelations of the combined pre- and post-test scores. It became clear that intercorrelations on pre-test work were much lower than those of post-test material. It is therefore presumed that in much of the pre-test work judges had difficulty in identifying those criteria which, following the two week instruction period, became more clearly isolable because of the instructional focus upon them.

It should also be kept in mind that the criteria themselves, though drawn from previous research by recognized authorities, had not previously been combined in an evaluative instrument of this nature. To test its validity extensively was not, however, administratively feasible, nor was it within the purposes of this study.

Finally, in the case of Criterion three: "Rearrangement", wherein the lowest intercorrelations of the series appear, it is felt that the schematic drawings derived from the still lifes and displayed to give judges a referent for the extent to which rearrangement took place, were possibly not as successful as large photographs of the originals would have been. It is moreover doubtful whether "Rearrangement" was even a wholly suitable criterion for works which in fifty percent of the cases had only two objects (the rock and the branch) from which to derive pictorial rearrangement.

On the basis of these circumstances, therefore, it was decided to accept reliability of the judges on five of the criteria: "Variety within shapes"; "Connectedness and organizational unity"; "Imagination--drama"; "Use of texture"; and "Gradation of values". Findings noted under Criteria five: "Imagination--exaggeration" and eight: "Variety between shapes" are to be regarded with considerable caution. Findings under criterion three: "Rearrangement" cannot be regarded as having any statistical validity. Findings on all eight criteria are, however, reported, and are examined in detail in Chapter V.

Statistical Procedures for Analysis of Data

Mean scores obtained from judge composite scores of individual works were employed as data for a two factor (subject matter and medium) analysis of covariance on each of the eight criteria, using the type of multiple regression analysis described by Bottenberg and Ward.⁵⁵ In addition to permitting linear adjustment of the covariate, regression analysis lends itself readily to computer programming. The IBM 7040 computer at the University of Alberta was used for data processing.

The formula employed in multiple regression analysis makes use of the difference occurring between a full regression model, which includes specific variables, and a restricted model, from which these variables are omitted. The proportion of the variance of the criterion variable which can be predicted is represented by R^2 , and the greater

⁵⁵R. A. Bottenberg and J. H. Ward, "Applied Multiple Linear Regression" (Alexandria, Va. Defense Documentation Center, 1963).

the difference occurring between R^2 in the full model and R^2 in the restricted model, the greater the influence of the variables being tested.

The degrees of freedom in the case of the numerator are made up of the number of unknown weights in the full model minus the number of unknown weights in the restricted model. In the case of the denominator, the degrees of freedom are made up of the number of subjects minus the number of unknown weights in the full model.

The formula to determine the "F" ratio for each of the eight criteria may therefore be drawn up as follows:

$$F = \frac{(R_1^2 - R_2^2) / dfN}{(1 - R_1^2) / dfD}$$

where R_1^2 represents the squared multiple correlation for the full model

R_2^2 represents the squared multiple correlation for the restricted model

dfN represents the degrees of freedom for the numerator

dfD represents the degrees of freedom for the denominator

Using this formula, "F" ratios and levels of significance were obtained for each of the eight criterion variables under the null hypothesis H_0A . Those results were further compartmentalized to show which of the variables involved, comprising subject matter, medium, and the combination of subject matter and medium, showed statistical significance and might therefore be considered as having influenced the performance of one or several of the groups. These variables are hereafter referred to in Chapters IV and V as sub-components of the criterion variable being examined.

The third statistical procedure to be considered was the treatment

of the adjusted scores assigned each group by the regression models. For the sake of clarity, graphs were prepared which were designed to illustrate the interactional relationship between groups on each of the eight criterion variables. Tables were developed to present the adjusted regression weights and these were combined with a presentation of the subcomponents of each criterion variable so that the following information might be readily elicited: relative positions of each group on the basis of adjusted regression weight scores; tabulation of results by groups for each criterion; and relative importance of each sub-component in results obtained by groups for each criterion.

Next, insurance against potential sources of bias was obtained by running a test for homogeneity of regression using a hypothesis which stated:

There will be no significant differences within each of the four groups in the relationship between pre- and post-test results on each of the following criterion variables:

- (1) Variety within shapes
- (2) Connectedness and organizational unity
- (3) Rearrangement
- (4) Imagination -- drama
- (5) Imagination -- exaggeration
- (6) Use of texture
- (7) Gradation of values
- (8) Dominance/subordination; variety between shapes

Homogeneity of regression ensures that the assumptions underlying the analysis of covariance may be fulfilled. These assumptions, detailed by Winer,⁵⁶ include ensuring the normal distribution of residuals and the use of the proper form of regression equation.

⁵⁶B. J. Winer, Statistical Principles in Experimental Design (Toronto: McGraw-Hill, 1962), p. 586.

Finally, chi square was employed to determine the extent to which students might be influenced in working strategy by the teacher's working strategy. Ten randomly selected score-cards containing pre-test scores were matched with their post-test counterparts, and a contingency table was set up which included three column headings: ratings which were greater in post-test than in pre-test (+); ratings which were smaller in post-test than in pre-test (-); and ratings which were identical on both pre- and post-test (=). These ten ratings, when multiplied by the number of judges, produced a total of sixty observations. When extended to cover the eight criterion variables, this number increased to four hundred and eight observations.

Expected scores were obtained by the following procedure:

$$\frac{\text{Row total} \times \text{Column total}}{\text{Total number of observations}}$$

and the chi square formula was then applied.

It was assumed that any significant shift in strategy would thus be revealed as a significant level of chi square.

Acceptable Levels of Significance for Statistical Data

The .01 level of significance was used for the acceptance or rejection of each hypothesis, since it was felt that rejecting the null hypothesis when it was in fact true (Type one error) would be more serious than accepting the null hypothesis when it was in fact false (Type two error).

Summary of Chapter IV

Chapter IV has dealt with the development of the evaluative instrument for the judging of works collected in the course of this study.

Mention has also been made of the selection of the expert art judges and the scoring procedure which they adopted in the evaluation of the art works. The bases on which the reliability of judge scores was accepted, and the statistical procedures employed in analysing the data obtained from composite judge scores, were also discussed.

CHAPTER V

ANALYSIS OF FINDINGS

This chapter is concerned with recording and analysing the results of those statistical procedures outlined in Chapter IV, and with a discussion of material supplied by the questionnaires.

Findings Concerning Differences between Experimental Treatment Groups

The Null Hypothesis (H_0A) was restated:

There will be no significant differences in mean gains among groups on the judged scores of each of the following criterion variables:

- (1) Variety within shapes
- (2) Connectedness and organizational unity
- (3) Rearrangement
- (4) Imagination -- drama
- (5) Imagination -- exaggeration
- (6) Use of texture
- (7) Gradation of values
- (8) Dominance/subordination -- variety between shapes

The results of the analysis of covariance for each of the criterion variables are presented in Table III. These eight criteria are dealt with individually as follows:

Variety within shapes, H_0A (1). There is no significant difference in mean gains among groups on the criterion "Variety within shapes."

Adjusted weights awarded each group in ranked order, as shown in Figure 3, were:

Group One	.641
Group Two	.029
Group Four	-.010
Group Three	-.017

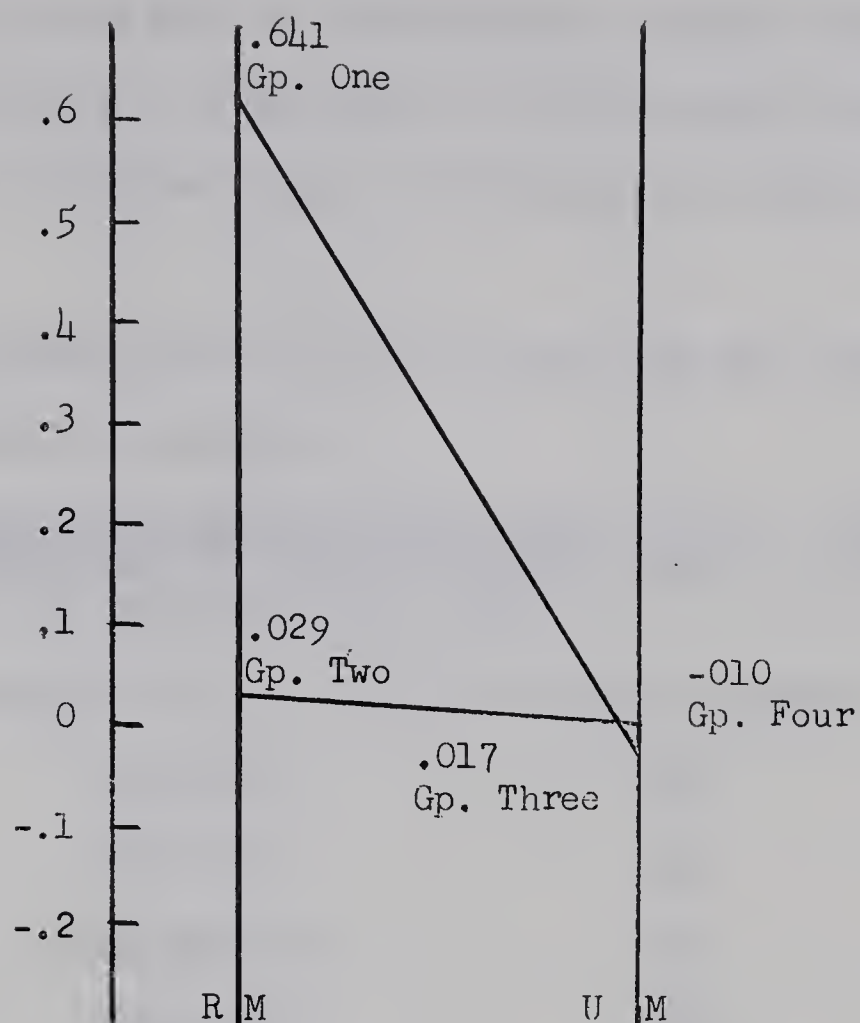
TABLE III

RESULTS OF AN ANALYSIS OF COVARIANCE TO TEST THE
HYPOTHESIS (H_0) OF NO DIFFERENCES
IN MEAN GAINS AMONG GROUPS OVER
EIGHT CRITERIA*

H_0A	R_1^2	R_2^2	"F"	Probability
1	.26611	.11235	4.0513	<.05
2	.14821	.08649	1.4012	not sig.
3	.06534	.00375	1.2743	not sig.
4	.22995	.10195	3.2147	<.05
5	.24332	.00863	5.9992	<.01
6	.25711	.08259	4.5445	<.01
7	.38866	.18636	6.3975	<.01
8	.25875	.12845	3.3982	<.05

df = 3/58

* Detailed on page 54



Criterion ONE: Variety within Shapes

Criterion	Sub-component	F	df	Probability
1	SM X M	5.3303	1/58	.05
	SM	1.5454	1/59	not sig.
	M	4.5637	1/59	.05

SM X M Effects of subject matter and media interaction

SM Effects of subject matter

M Effects of medium

Vertical lines labelled RM (Restricted media) and UM (Unrestricted media) are designed to clarify assigned group roles.

FIGURE 3

COMPARATIVE ACHIEVEMENT BY GROUPS AS DETERMINED BY ADJUSTED REGRESSION WEIGHTS; AND RELATIVE SIGNIFICANCE OF THE SUB-COMPONENTS (VARIABLES) INVOLVED

Reference to the data on sub-components revealed that both the effects of medium and of a combination of subject matter and medium were significant at the .05 level, while the influence of subject matter was not significant.

The significance level for H_0A (1) was less than .05. The null hypothesis was therefore accepted.

Connectedness and Organizational Unity, H_0A (2). There is no significant difference in mean gains among groups on the criterion "Connectedness and organizational unity".

Adjusted weights for each group, as shown in Figure 4, were:

Group One	.423
Group Two	.144
Group Three	.000
Group Four	.000

None of the sub-components was significant at the .05 level; and the probability for H_0A (2) was not significant.

The null hypothesis was therefore accepted.

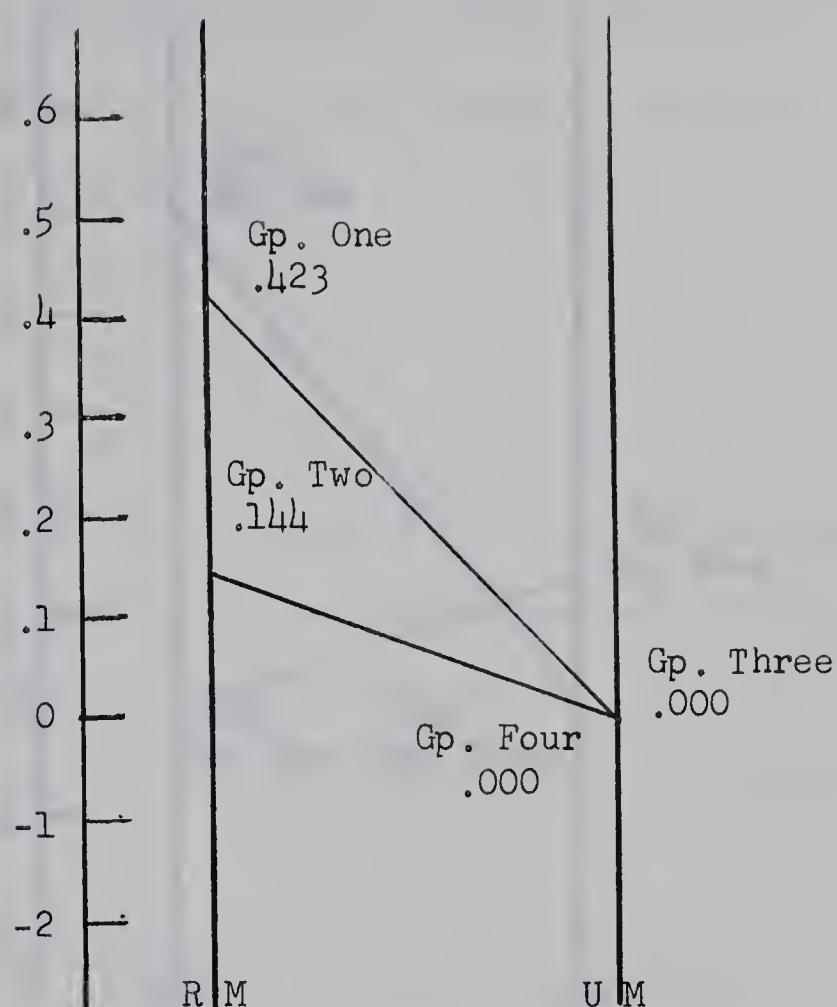
Rearrangement, H_0A (3). There is no significant difference in mean gains among groups on the criterion "Rearrangement".

Adjusted weights for each group, as shown in Figure 5, were:

Group One	.479
Group Four	.131
Group Three	.016
Group Two	.000

None of the sub-components was significant at the .05 level.

Similarly, the significance level as measured by the "F" ratio for H_0A (3) was not significant at the .05 level. The null hypothesis was therefore accepted.



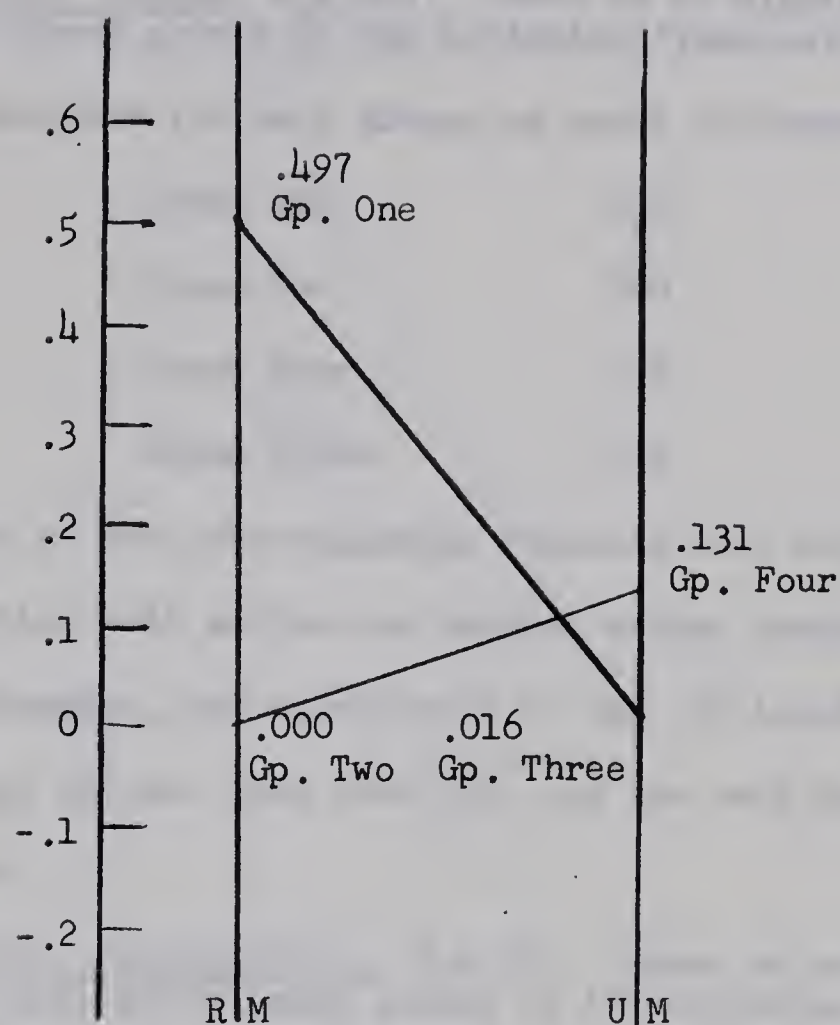
Criterion TWO: Connectedness and Organizational Unity

Criterion	Sub Component	F	df	Probability
2	SM X M	0.7166	1/58	not sig.
	SM	0.7068	1/59	not sig.
	M	2.4077	1/59	not sig.

SM X M	Effects of subject matter and media interaction
SM	Effects of subject matter
M	Effects of medium
RM	Restricted media
UM	Unrestricted media

FIGURE 4

COMPARATIVE ACHIEVEMENT BY GROUPS AS DETERMINED BY ADJUSTED REGRESSION WEIGHTS; AND RELATIVE SIGNIFICANCE OF THE SUB-COMPONENTS (VARIABLES) INVOLVED



Criterion THREE: Rearrangement

Criterion	Sub-component	F	df	Probability
3	SM X M	2.4604	1/58	not sig.
	SM	0.8347	1/59	not sig.
	M	0.3401	1/59	not sig.

SM X M Effects of subject matter and media interaction
 SM Effects of subject matter
 M Effects of medium
 RM Restricted media
 UM Unrestricted media

FIGURE 5

COMPARATIVE ACHIEVEMENT BY GROUPS AS DETERMINED BY ADJUSTED REGRESSION
 WEIGHTS; AND RELATIVE SIGNIFICANCE OF THE SUB-COMPONENTS
 (VARIABLES) INVOLVED

Imagination -- drama, H_0A (4). There is no significant difference in mean gains among groups on the criterion "Imagination -- drama."

Adjusted weights for each group, as shown in Figure 6, were:

Group One	.639
Group Two	.260
Group Four	.011
Group Three	-.061

Inspection of the sub-components revealed that neither subject matter in combination with medium nor subject matter contributed significantly. Medium, however, was significant at the .05 level. The significance level for H_0A (4) was less than .05, and the null hypothesis was therefore accepted.

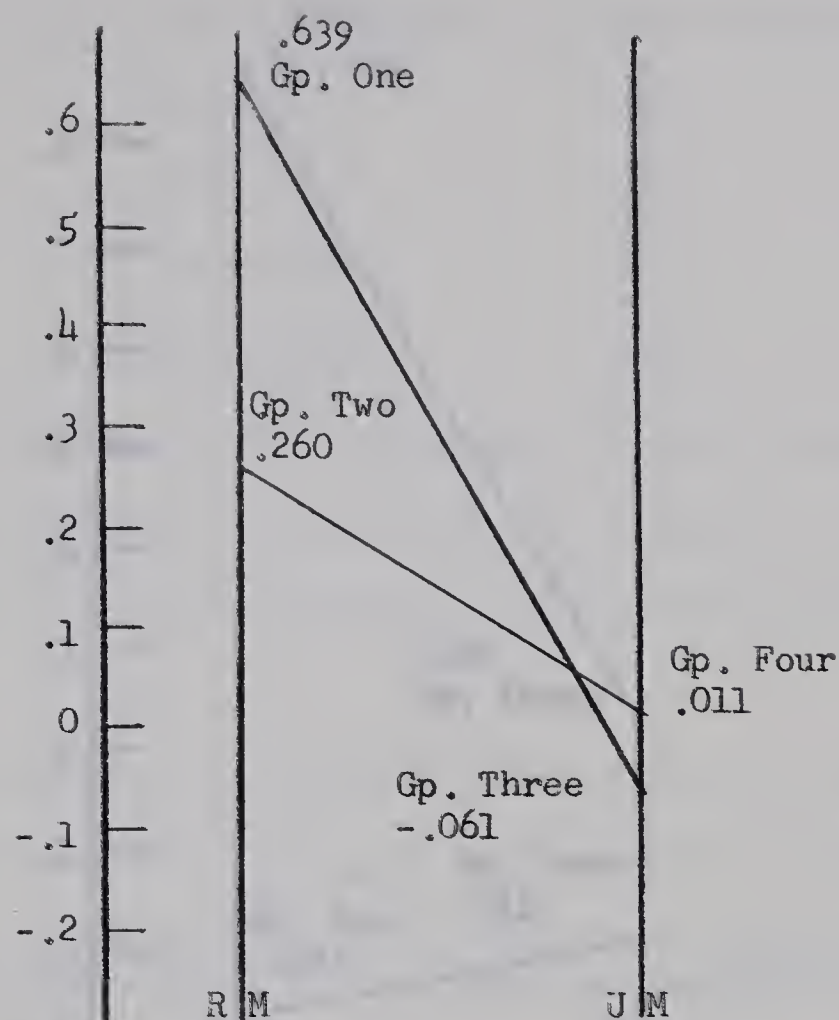
Imagination -- exaggeration, H_0A (5). There is no significant difference in mean gains among groups on the criterion "Imagination -- exaggeration".

Adjusted weights for each group, as shown in Figure 7, were:

Group One	.875
Group Three	.228
Group Four	.014
Group Two	-.073

Of the sub-components involved, only medium was not significant. The combination of subject matter and medium was significant at the .05 level, and subject matter was significant at the .01 level. The significance level for H_0A (5), was less than .01. The null hypothesis was therefore rejected in this case.

Use of texture, H_0A (6). There is no significant difference in mean gains among groups on the criterion "Use of texture".



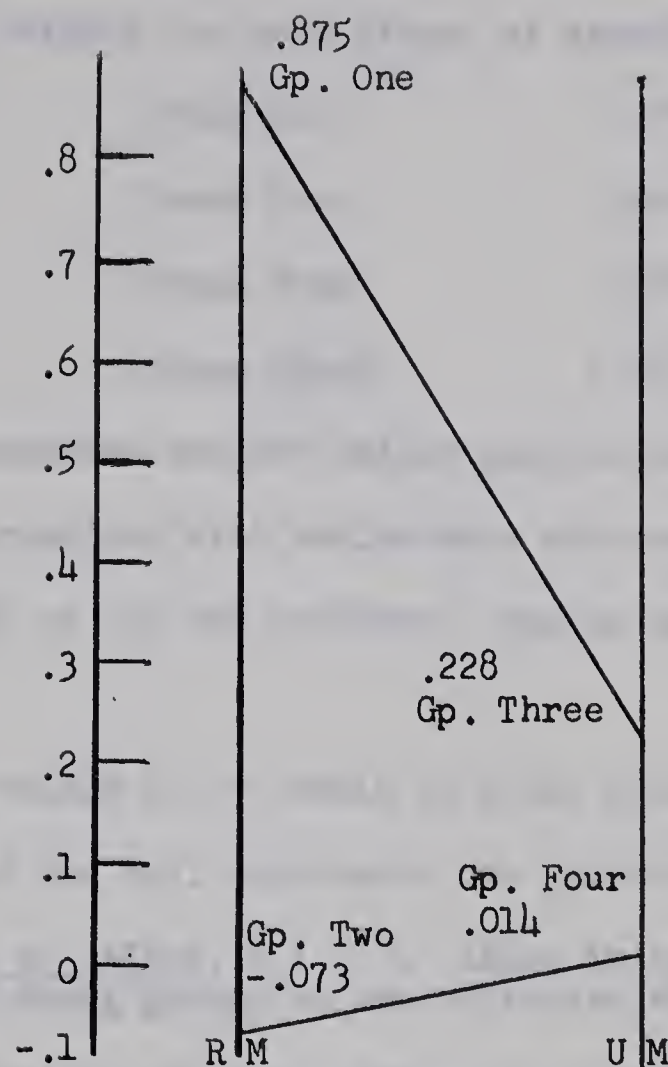
Criterion FOUR: Imagination -- Drama

Criterion	Sub-component	F	df	Probability
4	SM X M	1.8273	1/58	not sig.
	SM	0.8879	1/59	not sig.
	M	6.8634	1/59	<.05

SM X M Effects of subject matter and media interaction
 SM Effects of subject matter
 M Effects of medium
 RM Restricted media
 UM Unrestricted media

FIGURE 6

COMPARATIVE ACHIEVEMENT BY GROUPS AS DETERMINED BY ADJUSTED REGRESSION
 WEIGHTS; AND RELATIVE SIGNIFICANCE OF THE SUB-COMPONENTS
 (VARIABLES) INVOLVED



Criterion FIVE: Imagination -- exaggeration

Criterion	Sub-component	F	df	Probability
5	SM X M	4.6267	1/58	<.05
	SM	10.6996	1/59	<.01
	M	1.6131	1/59	not sig.

SM X M Effects of subject matter and media interaction
 SM Effects of subject matter
 M Effects of medium
 RM Restricted media
 UM Unrestricted media

FIGURE 7

COMPARATIVE ACHIEVEMENT BY GROUPS AS DETERMINED BY ADJUSTED REGRESSION
 WEIGHTS; AND RELATIVE SIGNIFICANCE OF THE SUB-COMPONENTS
 (VARIABLES) INVOLVED

Adjusted weights for each group, as shown in Figure 8, were:

Group One	.375
Group Two	.000
Group Four	.000
Group Three	-.589

On this occasion subject matter was the only non-significant sub-component. When combined with medium as a sub-component, however, a significance level of .01 was achieved. Medium was significant at the .05 level.

H_0A (6) yielded an "F" ratio of 4.54, which was significant at the .01 level, and the null hypothesis was therefore rejected.

Gradation of values, H_0A (7). There is no significant difference in mean gains among groups on the criterion "Gradation of values".

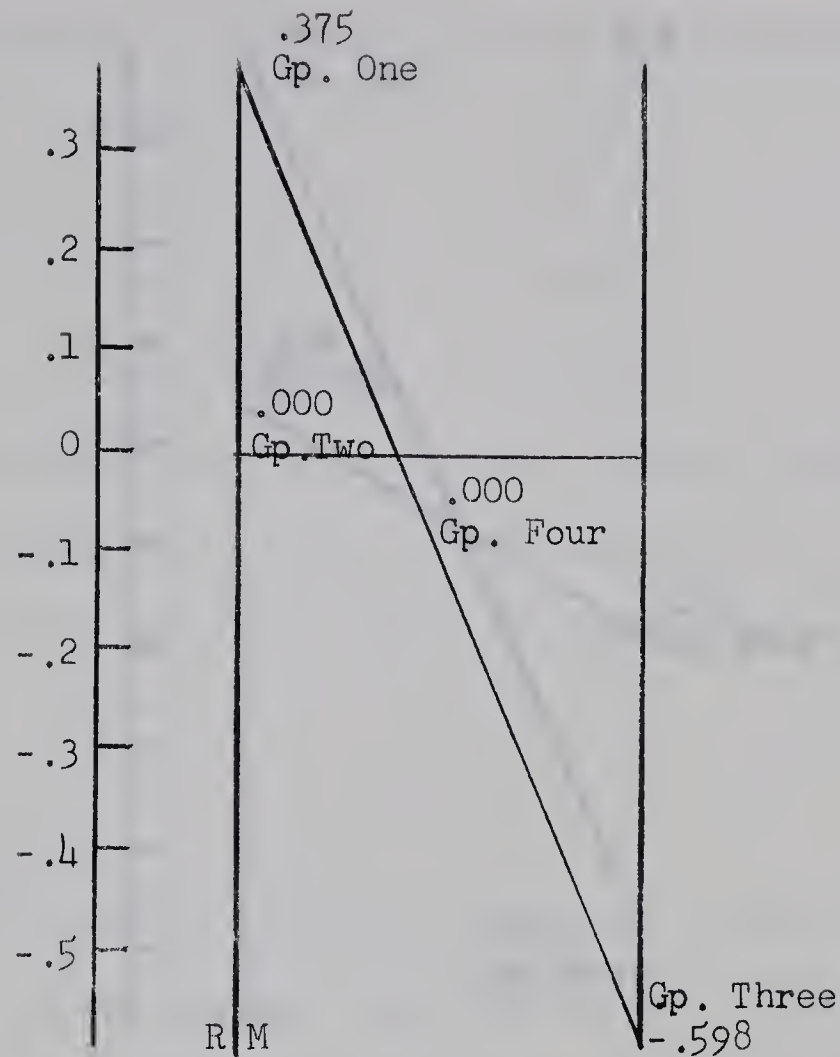
Adjusted weights for each group, as shown in Figure 9, were:

Group One	.899
Group Two	.532
Group Four	.313
Group Three	.000

Again subject matter was a non-significant sub-component.

Subject matter and medium combined was significant at the .05 level, and medium was significant at the .01 level. Since H_0A (7) was also significant at the .01 level, the null hypothesis was rejected.

Variety between shapes, H_0A (8). There is no significant difference in mean gains among groups on the criterion "Variety between shapes".



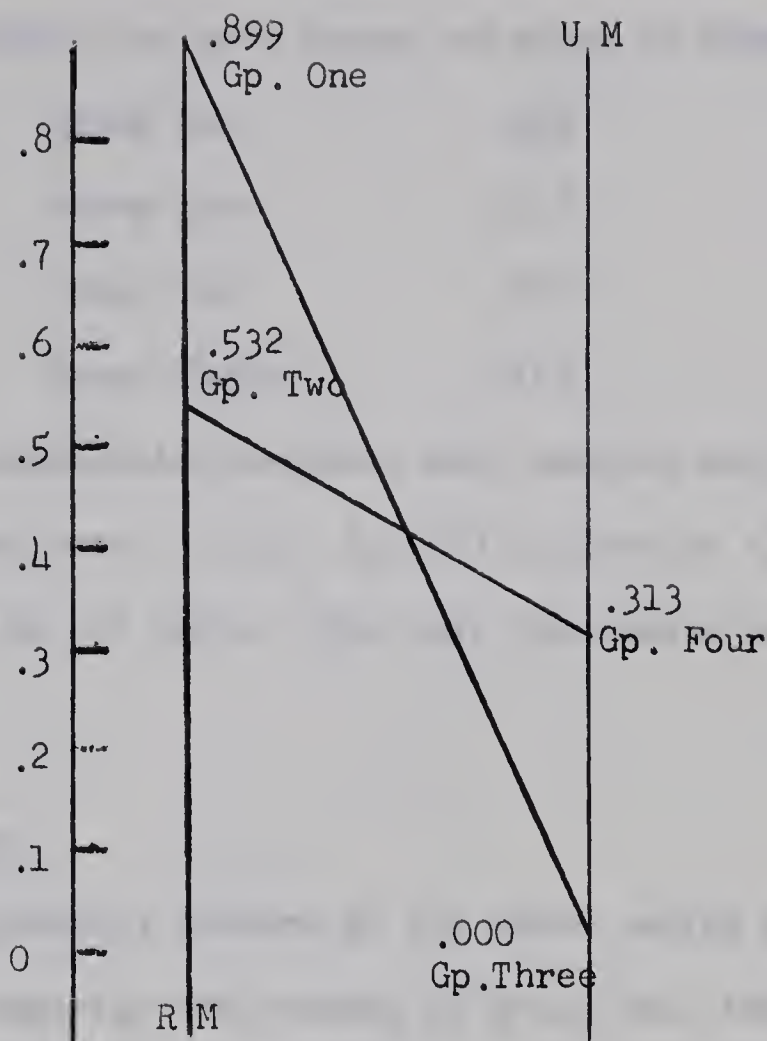
Criterion SIX: Use of texture

Criterion	Sub-component	F	df	Probability
6	SM X M	7.0938	1/58	.01
	SM	0.4169	1/59	not sig.
	M	5.5688	1/59	.05

SM X M Effects of subject matter and media interaction
 SM Effects of subject matter
 M Effects of medium
 RM Restricted media
 UM Unrestricted media

FIGURE 8

COMPARATIVE ACHIEVEMENT BY GROUPS AS DETERMINED BY ADJUSTED REGRESSION WEIGHTS; AND RELATIVE SIGNIFICANCE OF THE SUB-COMPONENTS (VARIABLES) INVOLVED



Criterion SEVEN: Gradation of values

Criterion	Sub-component	F	df	Probability
7	SM X M	6.2408	1/58	<.05
	SM	0.0517	1/59	not sig.
	M	11.8873	1/59	<.01

SM X M Effects of subject matter and media interaction
 SM Effects of subject matter
 M Effects of medium
 RM Restricted media
 UM Unrestricted media

FIGURE 9

COMPARATIVE ACHIEVEMENT BY GROUPS AS DETERMINED BY ADJUSTED REGRESSION WEIGHTS; AND RELATIVE SIGNIFICANCE OF THE SUB-COMPONENTS (VARIABLES) INVOLVED

Adjusted weights for each group, as shown in Figure 10, were:

Group One	.426
Group Four	.115
Group Two	.000
Group Three	-.187

Of the sub-components involved, only subject matter in combination with medium was significant (.01). H_0A (8) yielded an "F" ratio which was not significant at the .01 level. The null hypothesis was therefore accepted.

Discussion of Results

The most noticeable feature of the above series of findings was the consistency of superior achievement by Group One, the group which was restricted in both subject matter and media choice. Neither Group Two, (restricted in media but not in subject matter), nor Group Four, (unrestricted in both media and subject matter), had any consistent advantage over the other, but both achieved at a higher level than did Group Three, (restricted in subject matter but not in media choice), on most of the criteria specified in this study.

Reference to the graphs, drawn up to show the relative positions of groups as revealed by the testing of each of the above hypotheses, reinforces the evidence of superior achievement by Group One (restricted in subject matter and media).

The comparatively low ratings assigned to Group Three (restricted in subject matter but not in medium); and the slight advantage enjoyed by Group Two (restricted in medium), over Group Four (unrestricted in

Table 1. Results of the analysis of variance for the dependent variable.

Source	SS
Between groups	1.15
Within groups	1.15
Total	2.30

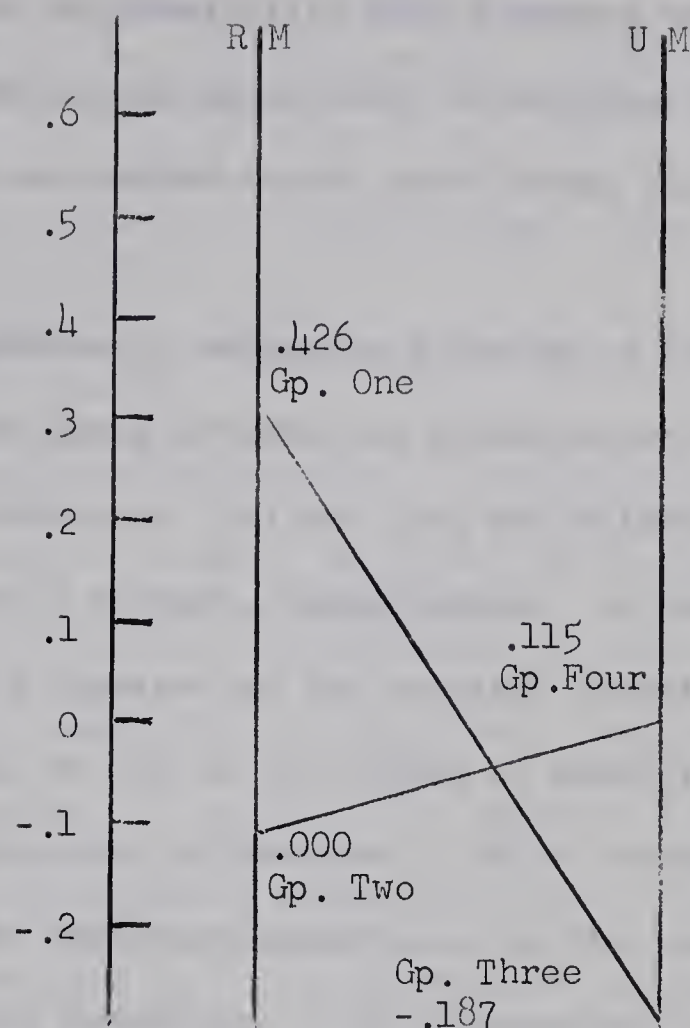
The analysis of variance for the dependent variable, the number of correct responses, was conducted. The results are presented in Table 1. The analysis of variance for the dependent variable, the number of correct responses, was conducted. The results are presented in Table 1. The analysis of variance for the dependent variable, the number of correct responses, was conducted. The results are presented in Table 1.

Discussion of Results

The most notable feature of the above series of findings was the consistency of superior performance by Group One. The group which was restricted in both subject matter and social status, Group Two, (restricted in social status but not in subject matter), and Group Three, (unrestricted in both social and subject matter), had no consistent advantage over the other, but this advantage was a highly novel one (Group Three). Restricted in subject matter but not in social status, as well as the criteria specified in this study.

Referring to the groups, Group One shows the relative positions of groups as revealed by the results of each of the above hypotheses. Table 1 shows the results of repeated measures by Group One (restricted in subject matter and social status).

The hypothesis for the first group, Group One (restricted in subject matter and social status), was that the results of the analysis of variance for the dependent variable, the number of correct responses, would be significant.



Criterion EIGHT: Variety between shapes

Criterion	Sub-component	F	df	Probability
8	SM X M	7.9175	1/58	.01
	SM	0.1170	1/59	not sig.
	M	1.7968	1/59	not sig.

SM X M Effects of subject matter and media interaction
 SM Effects of subject matter
 M Effects of medium
 RM Restricted media
 UM Unrestricted media

FIGURE 10

COMPARATIVE ACHIEVEMENT BY GROUPS AS DETERMINED BY ADJUSTED REGRESSION WEIGHTS; AND RELATIVE SIGNIFICANCE OF THE SUB-COMPONENTS (VARIABLES) INVOLVED

medium), point to the possibility that students using unrestricted media may have had insufficient opportunity to explore the individual characteristics of any one medium to the point where they could capitalize on it.

The importance of medium as a factor in evaluation is suggested by its probability level of .011 for Criterion 4: "Imagination -- drama", and probability levels of .021 and .001 on Criteria 6: "Use of texture", and 7: "Gradation of values", respectively. It should be noted that these probability levels appeared on the original computer output sheet, and have appeared only as .01 or .05 levels of significance in the analysis concerning between-group differences. While one might predict that medium would be an important constituent in the presentation of textural effect and in tonal gradation, it is interesting to consider the possibility that the judges tended to see dramatic effect in terms of the extent to which a medium was exploited.

A further implication may be drawn from the results concerning Criterion 5: "Imagination -- exaggeration." Since both Groups One and Three were restricted in subject matter choice, it may well have been that their superior performance on this criterion is the result of a need to experiment with the subject matter in a manner which the unrestricted subject matter groups found either unnecessary or unprofitable.

Summary of Results Derived from the Hypothesis concerning Differences among Experimental Treatment Groups

The following hypothesis was tested:

H₀A There will be no significant differences in mean gains among groups on the judged scores of each of the following criterion variables:

- (1) Variety within shapes
- (2) Connectedness and organizational unity
- (3) Rearrangement
- (4) Imagination -- drama
- (5) Imagination -- exaggeration
- (6) Use of texture
- (7) Gradation of values
- (8) Dominance/subordination -- variety between shapes

On the basis of results obtained the null hypothesis (H₀A) was rejected at the .01 level of significance in terms of criteria five, six, and seven. Of the remainder, criteria one, four, and eight were found to be significant at the .05 level, while criteria two and three were not significant at either the .01 or the .05 level. In any consideration of these results, however, the limited validity of criteria three, five, and eight must be remembered.

Findings Concerning Homogeneity of Regression

The second set of hypotheses, termed H₀B, concerned the prediction that:

There will be no significant differences within each of the four groups in the relationship between pre- and post-test results on each of the following criterion variables:

- (1) Variety within shapes
- (2) Connectedness and organizational unity
- (3) Rearrangement
- (4) Imagination -- drama
- (5) Imagination -- exaggeration
- (6) Use of texture
- (7) Gradation of values
- (8) Dominance/subordination -- variety between shapes

"F" tests for homogeneity of regression among the four groups revealed no significant differences on each of the above criteria at

TABLE IV

RESULTS OF A PROCEDURE TO TEST A HYPOTHESIS (H_0B) FOR HOMOGENEITY
OF REGRESSION AMONG GROUPS OVER EIGHT CRITERIA*

H_0B	R_1^2	R_2^2	F	P
1	0.28759	0.26611	0.5527	not sig.
2	0.15925	0.14821	0.2409	not sig.
3	0.08387	0.06534	0.3708	not sig.
4	0.23163	0.22995	0.0401	not sig.
5	0.24773	0.24332	0.1075	not sig.
6	0.27378	0.25711	0.4209	not sig.
7	0.40759	0.38866	0.5861	not sig.
8	0.29012	0.25875	0.8103	not sig.

df 3/55

*Detailed on page 54

either the .01 or .05 levels of significance. The null hypothesis was therefore accepted in all eight instances.

Descriptive Analysis of Questionnaire Data

Questionnaires were administered following Lessons Three and Eight, and the data obtained from them provided an interesting additional dimension to the study, since indirectly they reflected the general tone of each class. Although all the collected questionnaires included answers to the questions detailed in Appendix E of this study, optional comments on impressions of and reactions to the programme appeared only as specifically mentioned in the initial sentence dealing with each group.

Group One (restricted subject matter, restricted media).

Optional comments, appearing on seven questionnaires, generally reflected cautious approval of the programme. There was one complaint of lack of time to complete projects, and one subject disapproved of being "used as a guinea pig". In all four groups, however, those disapproving were the exceptions, and "attitude" was almost invariably rated three or higher.

One of the factors which the researcher had felt might present the greatest problem to subjects in the restricted subject matter groups (Groups One and Three) was that of having to work from the same subject matter day after day. It was therefore enlightening to note that only two papers included ratings below three on the "Boring/Challenging" continuum; this may be partially explained by a similar rating of "Materials".

Another factor contributing to the generally optimistic tone of the Group One questionnaires was the sense of awareness of direction. In

TABLE V

RATINGS ASSIGNED BY GROUP ONE STUDENTS (N=10) ON THE PROGRESS
EVALUATION AND SELF-ASSESSMENT QUESTIONNAIRE

Rating	Negative				Positive	
	1	2	3	4	5	
Material	-	1	4	5	-	
Problems	-	-	5	3	2	
Attitude	1	2	3	4	-	
Direction	-	1	3	4	2	
Progress	1	3	4	2	-	
Potential	-	2	7	1	-	

Questionnaire ONE

Rating	Negative				Positive	
	1	2	3	4	5	
Material	1	2	-	6	1	
Problems	-	2	4	4	-	
Attitude	-	-	6	3	1	
Direction	-	-	5	4	1	
Progress	1	1	5	3	-	
Potential	-	2	7	1	-	

Questionnaire TWO

only one case (in a first questionnaire) did anyone score less than three on the "Obscure/Clear" continuum. Similarly, progress was felt to be either maintained or improved in all except one case.

Finally, self ratings of potential remained one hundred per cent constant on a comparison of first and second questionnaires. Since this group included a majority of Grade XII students, it is presumed that they may have already formulated a fairly consistent self-image.

Group Two (unrestricted subject matter, restricted media). Nine questionnaires carried comment. Three expressed approval, four found the materials and problems non-stimulating or restrictive, and one felt that the time available for problem-solving was too short. An example of the inconsistencies which occasionally appeared in questionnaire responses is the claim by one student to be uninterested in Nature as a source for ideas while at the same time "Problems" was rated at four on the Boring/Challenging continuum, and "Progress" was rated at four on the Low/High continuum on both questionnaires.

All subjects except one scored "Materials" at three or better on both questionnaires. Despite this, five ratings on the second questionnaire were lower than on the first and no ratings improved on the second questionnaire. Possibly the reason for this is that the students were asked to attempt problems during the second week which demanded a more precise medium than charcoal; or it may have been that the material simply was less stimulating. Nevertheless, sixty-six per cent of the students rated "Problems" at either four or five on the "Boring/Challenging" continuum.

TABLE VI

RATINGS ASSIGNED BY GROUP TWO STUDENTS (N=12) ON THE PROGRESS
EVALUATION AND SELF-ASSESSMENT QUESTIONNAIRE

Rating	Negative				Positive	
	1	2	3	4	5	
Material	-	-	3	8	1	
Problems	-	1	3	6	2	
Attitude	-	-	9	2	1	
Direction	2	-	5	3	2	
Progress	-	-	6	5	1	
Potential	1	2	3	5	1	

Questionnaire ONE

Rating	Negative				Positive	
	1	2	3	4	5	
Material	-	1	5	6	-	
Problems	-	1	2	7	2	
Attitude	-	1	9	1	1	
Direction	-	3	4	4	1	
Progress	-	2	4	6	-	
Potential	2	1	7	2	-	
Choice	-	2	2	7	1	

Questionnaire TWO

It was felt prior to the setting of the questionnaires that in the case both of this group and Group Four (unrestricted subject matter, unrestricted media) there would be an appreciable difference in rating on Questionnaires One and Two on "Direction" as students gradually began to realize how related concepts were being revealed through what might at first have seemed to be a random collection of lessons. The answers on the questionnaires, however, do not bear this out. Eight out of twelve subjects in Group Two rated "Direction" three or higher on the "Obscure/Clear" continuum on both first and second questionnaires. Of the other four, two felt the direction became increasingly obscure and two felt it became clearer.

Self-rating of potential varied from the first to the second questionnaire; in only six cases did self-ratings correspond. Of the remaining six, all subjects rated themselves one rating lower on the second questionnaire.

In the extra category on choice introduced in the second questionnaire, approximately eighty-four per cent of the subjects felt they had sufficient opportunity for making choices.

Group Three (restricted subject matter, unrestricted media).

From ten subjects, completing two questionnaires each, nine comments were elicited, four of which were critical of the lack of choice in subject matter, three approving of the programme, and two doubtful of the direction it was taking. In one of the two latter cases rating of "Direction" was four on both questionnaires, however; while in the other the rating went from two on the first questionnaire, when the comment was made, to five on

TABLE VII

RATINGS ASSIGNED BY GROUP THREE STUDENTS (N=10) ON THE PROGRESS
EVALUATION AND SELF-ASSESSMENT QUESTIONNAIRE

Rating	Negative				→ Positive	
	1	2	3	4	5	
Material	-	1	1	8	-	
Problems	1	-	4	1	4	
Attitude	1	-	2	6	1	
Direction	-	2	4	3	1	
Progress	-	1	6	3	1	
Potential	1	2	2	3	2	

Questionnaire ONE

Rating	Negative				→ Positive	
	1	2	3	4	5	
Material	-	2	3	4	1	
Problems	-	1	2	5	2	
Attitude	-	-	3	5	1	
Direction	-	-	3	3	4	
Progress	-	2	2	5	1	
Potential	1	-	1	6	2	

Questionnaire TWO

the second questionnaire.

One subject rated all six factors consistently low. Otherwise scores on "Materials", "Problems", and "Attitude" were in the three or above range. All ten subjects rated "Direction" at the three or above level on the second questionnaire; five subjects felt they had made positive progress as scored on the "Progress" criterion, while two felt their work had deteriorated. It was noteworthy that while fifty per cent of the subjects maintained the same self-rating for "Potential", of the remainder, four out of five improved their self-rating. This makes an interesting contrast to the Group Two self-ratings, and may be a reflection on the part of Group Three students of the confidence that comes from familiarity with the subject matter.

Group Four (unrestricted subject matter, unrestricted media).

Ten questionnaires contained comment. Two subjects felt there was insufficient time for problem solving, one mentioned lack of specific direction, four either expressed dislike for the material or found the lessons monotonous, and four expressed approval of the programme.

As in Group Two a drop in interest in materials during the second week was accompanied by an increase in "Problems" ratings. The direction of the programme became more clear in six cases and remained at the three level or higher in a further four cases. Similarly, in ten cases progress was felt to have been made, though much of it occurred at the one to two level. For those to whom the purpose of the series remained unclear progress self-ratings were consistently low, and interest in the problems was also at a low level.

TABLE VIII

RATINGS ASSIGNED BY GROUP FOUR STUDENTS (N=16) ON THE PROGRESS
EVALUATION AND SELF-ASSESSMENT QUESTIONNAIRE

Rating	Negative				Positive	
	1	2	3	4	5	
Material	1	1	5	8		1
Problems	2	7	3	3		1
Attitude	2	3	7	3		1
Direction	1	5	3	6		1
Progress	3	8	5	-		-
Potential	2	4	7	3		-

Questionnaire ONE

Rating	Negative				Positive	
	1	2	3	4	5	
Material	2	2	7	3		2
Problems	2	3	4	5		2
Attitude	2	3	5	5		1
Direction	1	4	4	5		2
Progress	1	4	9	2		-
Potential	2	4	7	2		1
Choice	3	3	4	3		3

Questionnaire TWO

"Potential" self-ratings revealed that seven subjects maintained the same rating over both questionnaires, five improved their ratings, and of the remaining four, loss of rating related with a sense of lack of direction in three out of four cases.

In the final category, "Choice", six felt that they enjoyed a high degree of choice (four and five levels) while six felt that they had little choice (one and two levels). In all except one case those assigning a one or two rating had completed questionnaires which reflected a drop in ratings in most categories between Questionnaires One and Two.

Summary of Inferences. While it might be presumptuous to derive any definite conclusions from the information collected in these questionnaires, several inferences may be drawn. First, doubts about the cooperation of students undertaking art projects of an experimental nature appear to have little foundation. The great majority approved of and cooperated in the experiment. Second, the forty-three minute period at present in use in Alberta schools, appeared in most cases to be sufficient for the needs of students undertaking the problems presented during the course of the ten lessons employed in this study. Third, the danger of deterioration of effort resulting from monotony of subject matter appears to be not as great as one might imagine. In the case of Groups One and Three, both of which were restricted in subject-matter choice, a sense of making progress and of being aware of the direction which the lessons were taking seem to have been the most vital factors, supported by the use of suitable motivational material. On the question of the self-rating of

"Potential" in its relation to each of the four groups, the writer does not presume to make any claim, but merely wishes to suggest that evaluation of this at the Art Ten level may vary depending on the student's assessment of his chance of successfully overcoming the immediate situation or problem with which he is faced.

Determination of Influence of Teacher Strategy upon Student Strategy

It was not anticipated that the two week period within which the experiment was conducted would provide sufficient time for the working strategy of the instructor to become apparent to the students and thereby translated into their work in the manner described by Doerter⁵⁷ in his study.

Chi square procedures applied to data derived from randomly selected score cards appear to support this assumption. The value of chi square was computed at 13.440, a figure which was not significant at either the .05 or the .01 level of confidence. It was therefore presumed that no major shift in strategy on the part of students had occurred.

Summary of Chapter V

Data obtained by testing each of the two major hypotheses were itemized and implications arising from the results were discussed.

Questionnaire data was handled at a descriptive level and

⁵⁷Doerter, op. cit.

inferences which might be drawn from the recorded reactions of the various groups were presented.

Finally, the results were recorded of a chi square test to determine the extent to which student working strategy might have been influenced by teacher working strategy in the course of the classroom experiment undertaken.

TABLE IX

CHI SQUARE APPLIED TO RANDOMIZED SCORES TO DETERMINE INFLUENCE
OF TEACHER STRATEGY UPON STUDENT STRATEGY

Criterion*	Frequency of Rating Change			Total
	+	-	+	
1	21	18	21	60
2	21	16	23	60
3	24	14	22	60
4	25	10	25	60
5	22	11	27	60
6	22	12	26	60
7	19	10	25	60
8	25	10	25	60
TOTAL	179	101	200	480

*Detailed in Figure 2, p. 44

χ^2 : 13.440

df: 14

p: >.05

CHAPTER VI

SUMMARY AND IMPLICATIONS OF THE STUDY

Summary of Procedures and Major Findings

This study was designed to investigate a variety of situations in which art learning might take place. The types of programme followed by the four experimental treatment groups were microcosmic embodiments of the procedures followed by practising teachers of art. Each group had a controlled degree of freedom of choice in the selection of two of the main components in any art project--subject matter and medium--while the degree varied from group to group.

The programme was conducted over a two week period in a city high school. Experimental treatments were randomly assigned to each of four groups, and each followed a sequence of prepared lessons designed to focus on eight variables in the execution of the art work. Drawings completed during the first and final lessons were used as pre-test and post-test material. These drawings were randomized and scored on a one to five basis by six expert art judges using score-sheets comprising a list of the eight variables mentioned above. Mean scores obtained for individual works were then used to provide data for an analysis of covariance to determine differences between groups, as well as within-group differences.

The findings indicated that there were significant differences at the .01 level between groups on three criterion variables. These were Criterion Five: "Imagination -- exaggeration", Criterion six: "Use of texture", and Criterion seven: "Gradation of values". Of the remainder,

only Criterion Two: "Connectedness and organizational unity" and three: "Rearrangement" were not significant at the .05 level.

A chi square test to determine the extent of teacher strategy influence on student art working strategy produced a figure which was not significant at either the .01 or the .05 level.

Results of the analysis of covariance procedure consistently favoured Group One, which had been restricted in both media and subject matter choice. Statistical evidence revealed that no one of the remaining three groups held any consistent advantage over the others.

Limitations, Implications, and Recommendations for Art Education

A study of this nature is essentially limited both in the circumstances under which it is undertaken and ipso facto in the conclusions which may legitimately be drawn from it. The fact that a sample from only one school was exposed to the programme, combined with the time restriction imposed upon lesson lengths and on the duration of the experimental period itself, must lead the reader to an awareness that this is a tentative reconnaissance in art education rather than an attempt to establish a bridgehead for a decisive and incontrovertible statement of desirable policy. Nevertheless various surveys conducted within the province of Alberta⁵⁸ in recent years have revealed the inadequacies of art training insofar as many teachers are concerned both while they are in attendance at university and subsequently when they either seek or are given a

⁵⁸Neil Cassidy, Master's thesis in preparation, University of Alberta, 1966.

programme of art to teach in the schools. These same teachers in the course of the school year often attempt to remedy deficiencies in training by offering innumerable projects culled from periodicals in the hope that students will find something in this ragbag of ideas which will occupy their attention.

One of the things which the present study has indicated is that such an approach is neither necessary nor indeed desirable. The position of Group One, a group restricted both in media and subject matter choice, bears this out. Its performance as revealed through statistical analysis, and the responses made in the questionnaires, both seem to indicate that the most reliable progress by a group is rather to be made gradually through thorough investigation of one limited area at a time. Similarly, while the notion of exposure to a variety of media is on principle desirable, what gives the medium significance is the degree of mastery which the artist has over it. It is not enough to provide the media; concentration on their particular qualities is necessary in order that they may be used to advantage. The comparative inability of Group Three, (restricted in subject matter but not in media choice), to deal with the same problems as those confronting Group One seems by statistical inference to be the result of inadequate control of the media. These impressions were reinforced for the researcher by a visual inspection of all the drawings; the tentative handling of media by non-restricted groups was visibly contrastable with the comparative confidence shown by the restricted groups.

Some passing comment may also justifiably be made in this context

regarding the apportionment of art budgets. Instead of the money being spent on a wide variety of materials of limited applicability, a proportion of it might with advantage be given over to providing motivational material, particularly slides. A glance at the sequence of lessons conducted for this study will show the vital role which the slide projector played in revealing new methods towards the solution of visual problems.

The claim for the adoption of one of the procedures undertaken in the course of this study as an unvarying pointer to success would of course be totally unrealistic. Nevertheless some comment is called for regarding the limitations of the type of programme followed by the unrestricted subject matter groups, Groups Two and Four. Many Art Ten classes are made up of individuals whose backgrounds in art vary considerably, depending on the nature and frequency of the art offerings in junior high school. A programme which attempts the production of art works through a revelation of concept presupposes a certain sophistication in the students' background which may well not exist. On the strength of certain of the information collected in the course of this experiment, the use of definite material through which concepts may be channelled might prove initially advantageous.

The entire field of objective evaluation of art products is one which raises its own crop of problems and ambiguities. It would seem that if one is a teacher of art one should be aware of what one is teaching towards and should be capable of assessing the degree to which these aims have been met. The validity of evaluative instruments of the type used in this study is of crucial importance to beginning teachers of art, for the provision of a series of these score-cards covering the

qualities or characteristics which are felt to be desirable in student work, together with a rationale for the scale employed, would provide a much more logical and consistent yardstick for evaluation than the largely idiosyncratic measures sometimes employed by instructors.

There are therefore numerous dimensions which experimental studies of this nature may develop. Further research is required with programmes similar to that employed in this study, but with variations in the time factor to ascertain the optimum ratio of time/creative production.

More work needs to be done on the usefulness of "cluster" projects incorporating aesthetic, historical, and studio activities in the development of one theme, such as "Colour as the revelation of expression." What practical difficulties do these activities pose when put into practice in the classroom?

A whole world of research is also open for exploration in the assessment of the validity of objective evaluative criteria. The question of how to increase reliability of judge scores so that higher inter-correlations are achieved, without at the same time biassing the judges to evaluate according to the subjective perceptions of the researcher, is an intriguing one to which at the moment no answer is forthcoming. Experiments undertaken with an evaluative instrument, to be used by expert art judges, then by intelligent laymen, so that the degree of consistency between the two groups' judgments may be assessed and conclusions drawn thereby on the objectivity of the instrument, should provide rich material for analysis.

One should however never lose sight of the role of the subjective dimension in the creation of an art product. A student with a high score on the type of instrument described above is not necessarily a better artist because he has exhibited definite progress in the utilization and realization of specific factors which contribute to the total effect of the art work. In the words of Henri Matisse:

To create is to express what we have within ourselves. Every genuine creative effort comes from within. We have also to nourish our feeling, and we can do so only with materials derived from the world about us. This is the process whereby the artist incorporates and gradually assimilates the external world within himself, until the object of his drawing has become like a part of his being, until he has it within him and can project it on to the canvas as his own creation.⁵⁹

The role of the teacher covers both the nourishment of feeling and the making aware to the student of the materials on which he may draw. What this study has demonstrated is that in the revelation of material there is no simple equation between variety of material and variety of expression, and that restriction need not be concomitant with deprivation.

⁵⁹Henri Matisse, "The Nature of Creative Activity," Education and Art, ed. Ziegfeld (Paris: Unesco, 1953), 21.

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

BIBLIOGRAPHY

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

A. BOOKS

- Bruner, Jerome. The Process of Education. Cambridge, Mass.: Harvard University Press, 1965.
- Burkhart, Robert C. Spontaneous and Deliberate Ways of Learning. Scranton: International Textbook Co., 1962.
- Dix, Marion Quin. "Planning Art Experiences," Education and Art: A UNESCO Symposium. Edited by E. Ziegfeld. Paris: Unesco, 1953, pp. 35 - 36.
- Ferguson, G. A. Statistical Analysis in Psychology and Education. Toronto: McGraw-Hill, 1959.
- Gaitskell, Charles D. and Margaret R. Art Education during Adolescence. Toronto: Ryerson Press, 1954.
- Guilford, Joy Paul. Fundamental Statistics in Psychology and Education. Toronto: McGraw-Hill, 1956.
- Johnson, Pauline. "Art for the Young Child," Art Education: the 40th Yearbook of the National Society for the Study of Education. Edited by W. Reid Hastie. Chicago: University of Chicago Press, 1965, pp. 51 - 85.
- Kincaid, Clarence E. "The determination and description of various creative attributes of children," Creativity and Art Education. Edited by W. L. Brittain. Washington: N.A.E.A. publication, 1964, pp. 108 - 115.
- Lanier, Vincent. Doctoral Research in Art Education. Los Angeles: University of Southern California, 1962.
- Logan, Frederick. The Growth of Art in American Schools. New York: Harper, 1955.
- Matisse, Henri. "The Nature of Creative Activity," Education and Art; a UNESCO Symposium. Edited by E. Ziegfeld. Paris: Unesco, 1953, pp. 21 - 22.
- Read, Herbert. Education through Art. London: Faber and Faber, 1958.
- Smith, Walter. Teachers' Manual of Freehand Drawing and Designing and Guide to Self-Instruction. Boston, 1873.
- Whipple, G. M. (ed.). Art in American Life and Education; the 40th Yearbook of the National Society for the Study of Education. Bloomington: Public School Publishing Co., 1941.

Whitford, William G. "Some Present and Recommended Practises in School Art," Art in American Life and Education: the 40th Yearbook of the National Society for the Study of Education. Edited by G. M. Whipple. Bloomington: Public School Publishing Co., 1941, pp. 460 - 462.

Winer, B. J. Statistical Principles in Experimental Design. Toronto: McGraw-Hill, 1962.

B. PERIODICALS

Barkan, Manuel. "Transition in Art Education," Art Education, XV (October, 1962), 12 - 18, 27.

Beittel, Kenneth R., and R. C. Burkhart. "Strategies of Spontaneous, Divergent and Academic Art Students," Studies in Art Education, V (1), 1963, 20 - 41.

Bernheim, Gloria. "The Dimensionality of Differential Criteria in the Art Product: an Empirical Study," Studies in Art Education, VI (1), 1964, 31 - 48.

Brittain, W. Lambert, and K. R. Beittel. "Analysis of levels of creative performance in the Visual Arts," Journal of Aesthetics and Art Criticism, XIX, 1960, 83 - 90.

Burgart, Herbert. "Towards a New Art," School Arts, LXV (October, 1965), 6 - 9.

Burkhart, Robert C. "Evaluation of learning in Art," Art Education, XVIII (April, 1965), 3 - 5.

Chapman, Laura. "Becoming and Being a Teacher of Art," Art Education, XVI (October, 1964), 18 - 20.

_____, "Some comments on 'Spontaneous, Divergent, and Academic Art Students'," Studies in Art Education, VI (1), 1964, 25 - 29.

Eisner, Elliot. "Towards a New Era in Art Education," Studies in Art Education, VI (2), 1965, 54 - 62.

_____, "A Paradigm for the Analysis of Visual Problem Solving," Studies in Art Education, III (1), 1961, 47 - 54.

Gordon, D. "Methodology in the Study of Art Evaluation," Journal of Aesthetics and Art Criticism, X, 1952, 339 - 352.

Henkes, Robert. "Nature--sole source of motivation," School Arts, LXV (November, 1965), 33 - 35.

Lienard, Margaret. "What is the relationship of children's satisfaction with their art products to improvement in art?" Studies in Art Education, III (1), 1961, 55 - 65.

Linderman, Earl. "Curriculum for Awareness," Art Education, XVII (June, 1964), 5 - 9.

Mattil, Edward, "The effect of a 'Depth' vs. a 'Breadth' Method of Art Instruction at the Ninth Grade Level," Studies in Art Education, VI (1), 1964, 75 - 87.

von Eckhardt, Wolf. "The Bauhaus," Horizon, IV (November, 1961), 58 - 75.

C. PUBLICATIONS OF THE GOVERNMENT AND OTHER ORGANIZATIONS

Bottenberg, R. A., and J. H. Ward. Applied Multiple Linear Regression. Alexandria, Virginia: Defence Documentation Center, Publication No. AD413218, 1963.

Department of Education, Province of Alberta. Senior High School Curriculum Guide for Art, Edmonton: Govt. Printer, 1958.

Frankston, Leon. "Effects of Two Programs and Two Methods of Teaching upon the Quality of Art Products of Adolescents," University Park: Pennsylvania State U. Cooperative Research Project No. S-055, 1964-1965.

D. THESES, DISSERTATIONS, UNPUBLISHED MATERIALS

Brose, Raymond E. "Performance in Drawing as related to the Use of Limited versus Varied Media." Unpublished doctoral dissertation, Stanford University, 1960.

Cassidy, Neil. Master's thesis in Preparation, University of Alberta, 1966.

Doerter, James M. "Influence of College Art Instructors upon their Students' Painting Styles." Doctoral dissertation, Pennsylvania State University, 1962.

- Kendrick, Vernon D. "The Influence of Repetition on the Overall Aesthetic Quality and the Completion Time of a Creative Art Task." Doctoral dissertation, Pennsylvania State University, 1960.
- Trowbridge, Norma. "Creativity of Children in Art Classes." Unpublished doctoral dissertation, Iowa State University, 1964.

APPENDIX A1

SEQUENCE OF LESSONS FOLLOWED BY GROUPS ONE AND THREE

(RESTRICTED SUBJECT MATTER)

LESSON	RESTRICTED SUBJECT MATTER
1	Rock and branch - drawing study, no advice or direction given
2	Interpretation of rock and branch as molecular clusters
3	Study of rock and branch as thrusts and forces *
4	Interpretation of rock and branch as character studies
5	Study of rock and branch as textured surfaces
6	Superimpositions involving alteration of viewpoints
7	As embodiments of hard roundness and sharp spikiness
8	As the antithesis of lesson seven *
9	Simplification to arbitrary shape eg. ovaloid and rectangle
10	Rock and branch - drawing study, no advice or direction given

* Indicates administration of questionnaire.

APPENDIX A2

SEQUENCE OF LESSONS FOLLOWED BY GROUPS TWO AND FOUR
(UNRESTRICTED SUBJECT MATTER)

LESSON	UNRESTRICTED SUBJECT MATTER
1	Selection from a variety of still-life arrangements using natural objects - no advice or direction given
2	Microscopic creatures and objects, eg. seeds, cross sections through seedbox, etc.
3	Aerial views of landscapes to handle contours imaginatively *
4	Patterns in water; eddies, shallow runs over stones, sunlight
5	Textures of natural forms, eg. sand dunes, snow drifts, rock faces
6	Atmospheric effects; cloud patterns, twilight effects
7	Vegetables and fruit; first in the round, then cut up.
8	Marine objects such as shells, sea urchins *
9	Creation of two dimensional effects from three dimensional material eg. branches against the snow
10	Selection from a variety of still-life arrangements using natural objects - no advice or direction given

* Indicates administration of questionnaire.

APPENDIX B

APPENDIX B

The following information is provided for the purpose of illustrating the various methods of determining the relative importance of different factors in the selection of a particular method of transport. The information is based on a survey of the methods of transport used by a group of 100 persons who were asked to indicate the relative importance of various factors in the selection of a particular method of transport. The factors are listed in the following table, and the relative importance of each factor is indicated by a number from 1 to 10, with 10 being the most important factor.

APPENDIX B

The following information is provided for the purpose of illustrating the various methods of determining the relative importance of different factors in the selection of a particular method of transport. The information is based on a survey of the methods of transport used by a group of 100 persons who were asked to indicate the relative importance of various factors in the selection of a particular method of transport. The factors are listed in the following table, and the relative importance of each factor is indicated by a number from 1 to 10, with 10 being the most important factor.

APPENDIX B

The following information is provided for the purpose of illustrating the various methods of determining the relative importance of different factors in the selection of a particular method of transport. The information is based on a survey of the methods of transport used by a group of 100 persons who were asked to indicate the relative importance of various factors in the selection of a particular method of transport. The factors are listed in the following table, and the relative importance of each factor is indicated by a number from 1 to 10, with 10 being the most important factor.

APPENDIX B1

SUMMARIES OF PRESENTATIONS TO RESTRICTED SUBJECT MATTER GROUPS

Lesson Two. Emphasis: Variety within shapes.

The class was asked to consider the example of molecules in boiling water, clustering and regrouping continually; and in biology the phenomenon of cells which tend to cluster or to spread out to form a variety of patterns. Slides were shown of cross sections of Nerium, Salsola, and Pinus Resinosa leaves, and students were asked how they might employ molecular patterns in restructuring the branch and rock. Suggestions included massing and compressing cells at junctions, drawing them in bands along the grain lines, and creating three dimensional effects within individual cells. It was put to them that an analogy to bear in mind might be working in clay, in which the structure is built outwards piece by piece.

Lesson Three. Emphasis: Variety between shapes.

Initial discussion focussed on various types of thrust and force - pressure, point, centripetal, and centrifugal; all of which were illustrated by slides and mounted drawings of, for example, a snail shell (centripetal) and a rock-face (pressure). The use of these features in paintings was mentioned, as when the eye is led from the foreground around the perimeter and finally to the centre of interest. The role of negative shape in the interpretation of thrusts and forces was also considered before the class embarked on a study of the rock and branch in these terms.

Lesson Four. Emphasis: imagination; exaggeration.

The work of Walt Disney was cited as exemplifying the anthropomorphic qualities often assigned by creative talent to inanimate objects. In the work of established artists featured in the slides shown to the class, including sculpture by Moore, Giacometti, Chadwick and by unknown African and pre-Hellenic carvers, it was noted that the problem facing the artist was how to bring the object alive yet avoid producing a caricature. The class was asked to attempt to isolate on paper those characteristics which might bring the rock and branch to a state of being/non-being, so as to give the impression that they were on the brink of assuming living form, or that having once been alive, they were now, like Lot's wife, transmuted into an inanimate condition.

Lesson Five. Emphasis: Texture and gradation of values.

The instructor began by asking the class to imagine the feel of the rim of a glass or a cup on one's lips; then to imagine how a fur-covered cup might feel....to imagine running one's fingers over sand or velvet; then dragging them down a sheet of rusty tin. Having thus suggested the evocative power of textures, the instructor presented slides of various natural textures (rock-faces, coarse grass) and asked that class members make apparent the distinct textures that the rock and branch presented.

Lesson Six. Emphasis: Organizational unity, overlap, rearrangement.

A perennial problem of the artist -- how to include all the interesting facets of an object or group of objects in one painting -- was

solved by Braque and Picasso in the early twentieth century through the invention of Analytical Cubism. The class was reminded of this and of the form which analytical cubism took -- such characteristics as superimposition of shapes, simplification and elimination of shapes and excess lines to avoid ambiguity, and the harmonious integration of one area with another. Taking the rock and branch as a starting off point, the students were asked to make several sketches from various points around the still life, and these were then combined in one composition.

Lesson Seven. Emphasis: Exaggeration.

This lesson began with an examination of certain approaches to dramatizing subject matter by exaggerating and distorting shapes. Two types of three dimensional work were presented via slides; metal sculpture, and carving in stone. Examples of the first type stressed spikiness and angularity, while those of the second type were blocky, compact, and closely knit. Artists featured included Moore, Flannagan, Smith, and Roszak. Class members were then given the task of rendering the rock and the branch as epitomes of hard roundness and sharp spikiness.

Lesson Eight. Emphasis: Drama, imagination.

A slide of Dali's "Persistence of Memory" was used to introduce a lesson on Surrealism, certain aspects of which were used in an interpretation of the rock and branch. It was suggested that students consider the most "unstonelike" qualities which a stone could possess, eg. weightlessness, plasticity; and similarly consider the branch. Drawings produced were essentially to embody qualities antithetical to those expressed in Lesson Seven.

Lesson Nine. Emphasis: Organizational unity.

The instructor pointed out that cases exist in which an artist deliberately suppresses detail and variations within objects in order to achieve unity of composition, or an appearance of austerity, or the best possible placement of arbitrary shapes. Examples from the work of Mondrian, Franz Kline, and Josef Albers were shown to illustrate various approaches to this problem, and the class was then called upon to try out several sketches of variations before translating one selected example into a full-size presentation.

APPENDIX B2

SUMMARIES OF PRESENTATIONS TO UNRESTRICTED SUBJECT MATTER GROUPS

Lesson Two. Emphasis: Reorganization and selection.

Students were reminded initially of the role of the microscope and the magnifying glass in revealing detail otherwise hidden. The instructor advised the students that the subject matter for the lesson was to be gathered from observation revealed through inspecting slides of plant forms. Slides of such plants as Elk thistles, Mushroom, Gentian; and cross sections of such features as Myriophyllum stem, were then shown, and a selection of these was re-presented at one minute intervals to give students an opportunity of making quick sketches of the plants. Students were then asked to create a composition using the forms already sketched as a basis for selection and organization of the design. A composition by Miro was used to show how such a composition might evolve.

Lesson Three. Emphasis: Exaggeration.

The class was asked to consider those forces which shaped the surface of the earth, eg. volcanic action, erosion, silting. Reference was made to the fascination which natural upheaval has for some artists, as revealed in themes such as "The Flood" and "Last Judgment", and in Kokoschka's "Tempest."

Mounted photographs were then displayed featuring river valleys, contour ploughing patterns, tundra, and mountain ranges, and the class was asked to translate these into a dramatic pattern as it might be observed

from a height varying from five hundred to five thousand feet, paying particular attention to the cycle of disintegration and regrouping which is typical of the natural process.

Lesson Four. Emphasis: Gradation of Values.

Initial motivation was provided by showing a slide of Winslow Homer's "Gulf Stream." It was pointed out that aside from the water itself, various "associational" features contributed to the identification of the content of the composition -- the sharks, the sailing ship on the horizon, the dismasted hulk in the centre foreground. The students were then asked to give consideration to those features which give clues to the direction and rate of flow of water eg. the piling up of pebbles and silt at the downstream end of larger stones, the variations in depth of channels formed by the action of the current, and the angle of reeds along the bank. Slides were shown of the patterns made in the sand by an outgoing tide; of foam on the surface of water; and of the play of sunlight on water. Students were then asked to plan logically a composition utilizing several indications of a specific type of waterscape, or certain features characteristic of a particular watercourse.

Lesson Five. Emphasis: Texture.

Discussion was initiated on the tactile aspects of texture, and thence on to the visual recognition of textures. Slides were shown of natural textures eg. dry, cracked earth, sanddunes and coarse grass; and of artists' interpretations of nature texture--Monet's water lily studies, Soutine's "Carcass of Beef". Students were then asked to devise a landscape utilizing several different types of texture; or if they

wished, they could assemble a non-objective composition made up of textured areas. Frottage and other synthetic or mechanical techniques were not to be used.

Lesson Six. Emphasis: Drama, imagination.

Visual stimulus for this lesson came from large photographs taken from magazines and mounted on illustration board. The class was reminded of the use made by movie-makers such as Alfred Hitchcock of atmospheric effects to heighten an impression of terror or mystery; and of Monet's haystack paintings, executed as a tour de force to illustrate the effects of light on subject matter.

Three photographs were shown to illustrate the transition from day to evening to night, and two reproductions followed (by Derain and Thomson) to demonstrate how the nature of Autumn in France and Northern Canada resulted in vastly different interpretations within the same subject-field. A photograph of a thunderstorm over the Arizona desert, featuring a "corona" effect in which light is dispersed, was contrasted with a painting by Bierstadt in which light was used to spotlight or focus upon the centre of interest.

Further atmospheric affects were shown in which sharp contrast, blurring of outlines, and strategic massing of shapes appeared. Then students were asked to create an imaginative composition in which the presentation of the dramatic, the lyrical, or some similar atmospheric effect was sought.

Lesson Seven. Emphasis: Variety within shapes.

Various kinds of fruit and vegetables were provided for the students, who were encouraged to make a number of sketches therefrom. Close observation of each article was stressed, and drawings both in the round and cross section were produced, the objective being a recognition of the individual character of each example. Louis Agassiz' methods were cited as being typical of the careful observation required in this project.

Lesson Eight. Emphasis: Dominance/subordination, variety between shapes.

Students were asked to select specimens from a tray containing various types of shells, sea-urchins, starfish, barnacles, and other non-vegetable forms of sea-life. On completion of a sketch or study of any one object the student returned it to the tray so that opportunity was provided for choice in selecting objects to be drawn. When several sketches had been thus completed the class was asked to compose a drawing of a design based upon these sketches. Whereas in the previous lesson each object was drawn without regard for its relationship to its neighbours, in this lesson the class was asked to consider both the individual qualities of each object and the relationship created between the several objects in the composition.

Lesson Nine. Emphasis: Unity, connectedness.

The introduction to a lesson on unity in composition was effected through a discussion of the silhouette. The instructor pointed out that though this approach results in loss of variety within objects, the loss is compensated for by the interest arising from the coalescing of masses

to form novel and unusual shapes. Students were then asked to choose from such subjects as trees against the snow or reeds in water, and to interpret these as two-tone compositions.

APPENDIX C



1



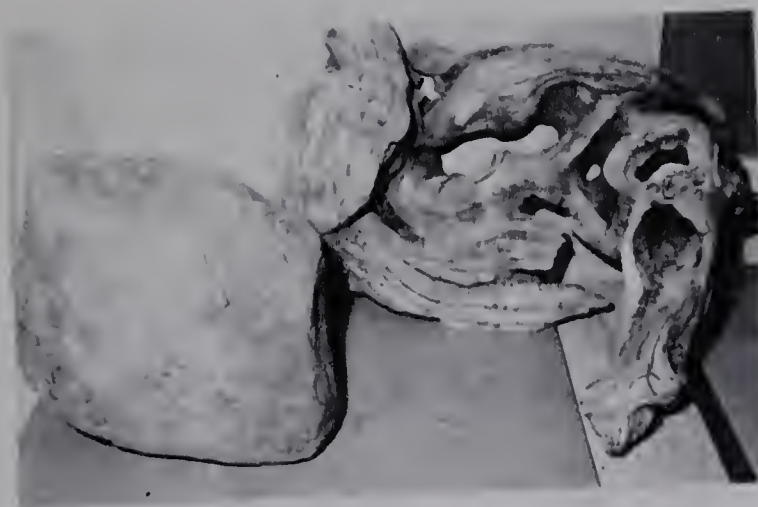
2



3



4



5

Appendix C1: Still lifes employed in the experiment



Group 1 Example: Gradation of values

Group 1 Example: Drama-exaggeration



Group 1 Example: Texture

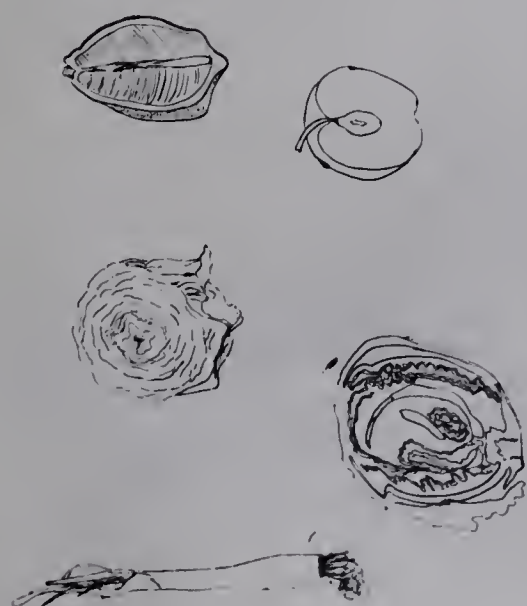


Group 2 Example: Drama-
imagination

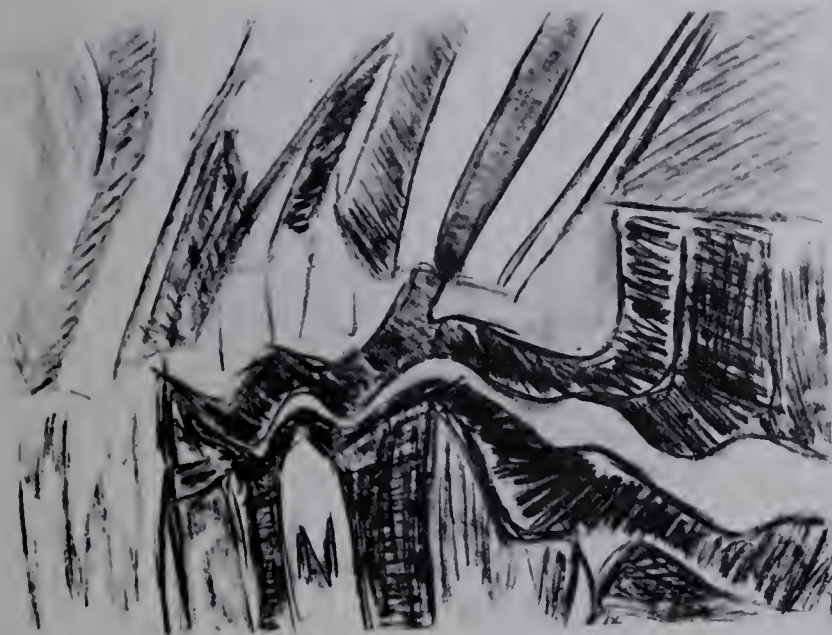


Appendix C2: Examples of work displaying a high degree of named characteristic

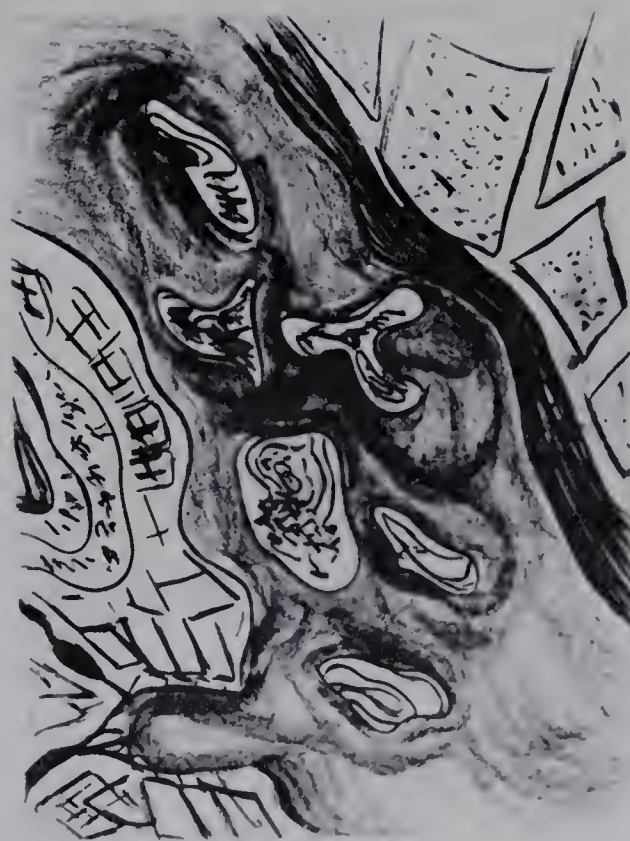
Appendix C3: Examples
from unrestricted
groups' lessons



Lesson 7 Group 4 Pen and ink
Lesson 4 Group 2 Charcoal

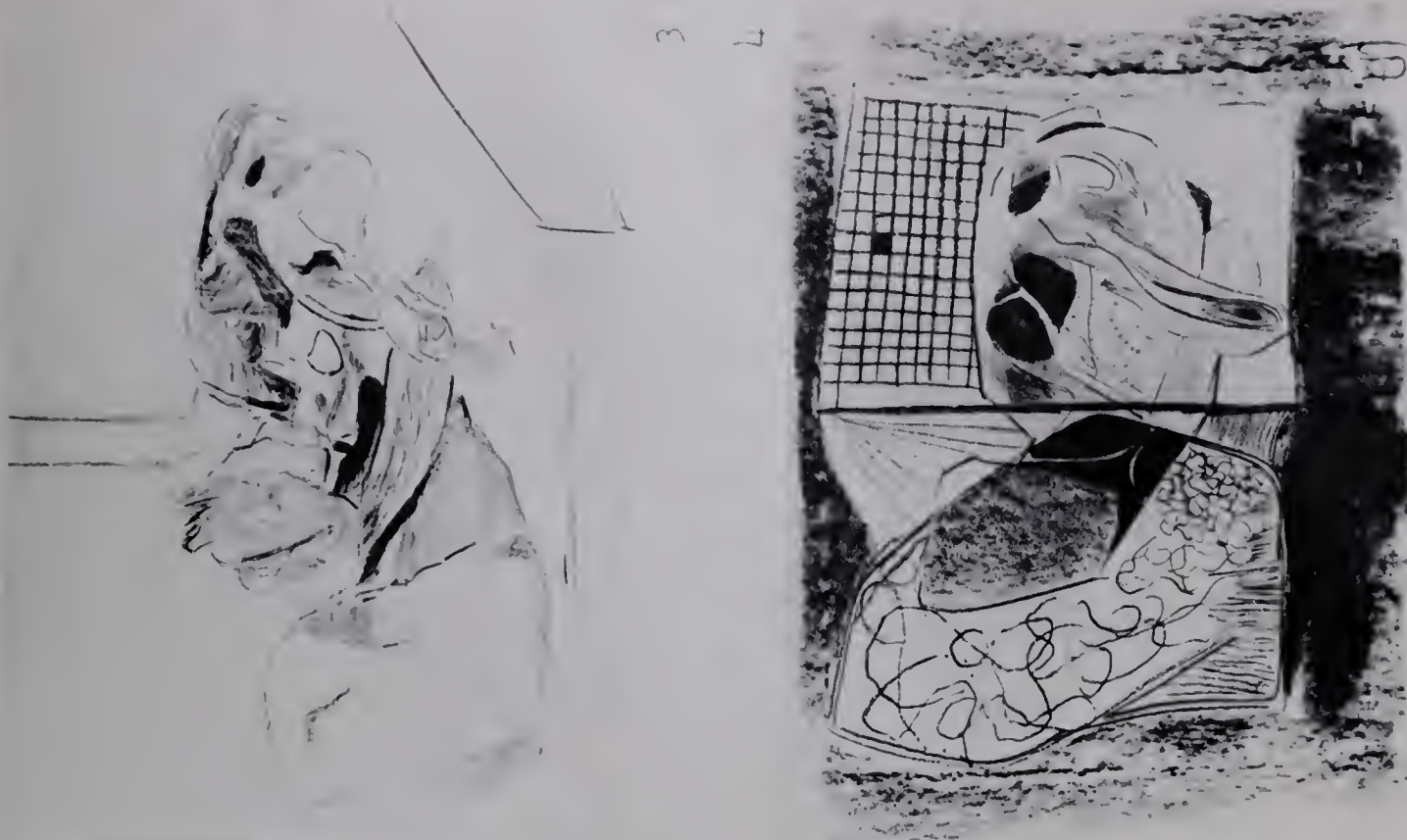


Lesson 3
Group 2
Charcoal



Lesson 6
Group 4
Tempera





1 2

Appendix C4: Examples of work by a Group 1 and a Group 2 student showing pretests (1 and 3) and post-tests (2 and 4). Composite scores awarded these works by six judges are shown in Appendix D overleaf

Table 1. Summary of the data used in the analysis.

Variable	Unit
Age	Years
Gender	Male/Female
Weight	Kg
Height	Cm
Body Mass Index	Kg/m ²
Heart Rate	Beats/min
Stroke Volume	L/min
Cardiac Output	L/min

Table 2. Summary of the data used in the analysis.

Variable	Unit
Age	Years
Gender	Male/Female
Weight	Kg
Height	Cm
Body Mass Index	Kg/m ²
Heart Rate	Beats/min
Stroke Volume	L/min
Cardiac Output	L/min

APPENDIX D

Variable	Unit
Age	Years
Gender	Male/Female
Weight	Kg
Height	Cm
Body Mass Index	Kg/m ²
Heart Rate	Beats/min
Stroke Volume	L/min
Cardiac Output	L/min

Variable	Unit
Age	Years
Gender	Male/Female
Weight	Kg
Height	Cm
Body Mass Index	Kg/m ²
Heart Rate	Beats/min
Stroke Volume	L/min
Cardiac Output	L/min

Figure 1. Summary of the data used in the analysis.

Figure 2. Summary of the data used in the analysis.

Figure 3. Summary of the data used in the analysis.

Figure 4. Summary of the data used in the analysis.

Figure 5. Summary of the data used in the analysis.

Group Two Pretest (Number 1)

Variety (within)	18
Org. Unity	20
Rearrangement	11
Drama	15
Exaggeration	15
Texture	19
Gradation	16
Variety (between)	17

Group Two Post Test (Number 2)

Variety	21
Org. Unity	19
Rearrangement	21
Drama	20
Exaggeration	21
Texture	18
Gradation	20
Variety (between)	20

Variety (within)	22
Org. Unity	18
Rearrangement	15
Drama	17
Exaggeration	14
Texture	19
Gradation	20
Variety (between)	18

Group One Pretest (number 3)

Variety (within)	25
Org. Unity	21
Rearrangement	22
Drama	22
Exaggeration	22
Texture	23
Gradation	24
Variety (between)	20

Group One Post Test (number 4)

APPENDIX D

COMPOSITE JUDGE SCORES ON EXAMPLES OF PRETEST AND POST TEST WORK

ILLUSTRATED ON PREVIOUS PAGE (APPENDIX C4)

APPENDIX E

APPENDIX E

APPENDIX E

PROGRESS EVALUATION AND SELF-ASSESSMENT QUESTIONNAIRE

The following questionnaire is designed to find out from you what you are getting from the lessons presented to you thus far. You are asked to circle the number which most closely corresponds to your feelings about various aspects of the course. For example, if you found that you felt, in answer to question 1, that the material was extremely boring, you would circle 1, thus (1); and if you felt that it was moderately interesting you would circle 3, thus (3); and if you felt that it was extremely interesting you would circle 5; thus (5).

Each question is explained in detail below, and the questionnaire follows the detailed explanation. Finally, as an optional extra, you may add any comments that seem relevant but are not included in the questionnaire.

Question 1. Material: What is your assessment of the material presented to you in these lessons e.g. slides, photographs, objects from which your ideas are drawn, etc.?

Question 2. Problems: What is your assessment of the problems that you are being asked to solve in these lessons?

Question 3. Attitude: What is your attitude in principle (ie., as a general rule or procedure) to projects of this nature?

Question 4. Direction: To what extent is the purpose of these lessons revealed? Does there seem to be evidence of an underlying theme or idea?

Question 5. Progress: How would you rate the progress you have made so far in this series of lessons?

Question 6. Potential: How would you rate your own achievement potential ie., how well do you think you are capable of doing in art (not necessarily by the end of this year, but in the foreseeable future)?

Question 7. (appearing only on 2nd questionnaire).

Choice: How much choice to you feel you have in the subjects you are being asked to draw in this series of lessons?

Circle the appropriate numeral

Q		Dull _____	Interesting
1	Material	1 2 3 4 5	
2	Problems	Boring _____	Challenging
3	Attitude	1 2 3 4 5	
4	Direction	Obscure _____	Clear
5	Progress	Low _____	High
6	Potential	1 2 3 4 5	
7	Choice	Little _____	Much
		1 2 3 4 5	

Additional Comment: _____

APPENDIX F

APPENDIX F

CORRELATIONS FOR INTER JUDGE RELIABILITY
(PRETEST - POST TEST COMBINED)

Criterion 1: Variety within shapes

	1	2	3	4	5	6
1	--	.58	.58	.54	.59	.57
2	--	--	.56	.48	.51	.53
3	--	--	--	.38	.36	.46
4	--	--	--	--	.56	.50
5	--	--	--	--	--	.61
6	--	--	--	--	--	--

Criterion 2: Connectedness and organizational unity

	1	2	3	4	5	6
1	--	.33	.34	.51	.40	.50
2	--	--	.58	.45	.42	.35
3	--	--	--	.56	.42	.40
4	--	--	--	--	.46	.39
5	--	--	--	--	--	.49
6	--	--	--	--	--	--

Based on a two tailed test of significance

.05 level of significance r = .250

.01 level of significance r = .325

df: 62

Criterion 3: Rearrangement

	1	2	3	4	5	6
1	--	.24	.37	.37	.16	.36
2	--	--	.29	.23	.21	.12
3	--	--	--	.48	.49	.52
4	--	--	--	--	.29	.35
5	--	--	--	--	--	.51
6	--	--	--	--	--	--

Criterion 4: Imagination - drama

	1	2	3	4	5	6
1	--	.46	.45	.39	.38	.50
2	--	--	.61	.44	.45	.56
3	--	--	--	.45	.31	.64
4	--	--	--	--	.46	.53
5	--	--	--	--	--	.50
6	--	--	--	--	--	--

Based on a two tailed test of significance

.05 level of significance r = .250

.01 level of significance r = .325

df: 62

Criterion 5: Imagination - exaggeration

	1	2	3	4	5	6
1	--	.18	.25	.40	.36	.36
2	--	--	.23	.21	.47	.43
3	--	--	--	.31	.58	.38
4	--	--	--	--	.42	.36
5	--	--	--	--	--	.31
6	--	--	--	--	--	--

Criterion 6: Use of texture

	1	2	3	4	5	6
1	--	.63	.67	.56	.57	.72
2	--	--	.58	.52	.59	.63
3	--	--	--	.62	.57	.63
4	--	--	--	--	.63	.66
5	--	--	--	--	--	.62
6	--	--	--	--	--	--

Based on a two tailed test of significance

.05 level of significance r = .250

.01 level of significance r = .325

Criterion 7: Gradation of values

	1	2	3	4	5	6
1	--	.56	.72	.61	.59	.47
2	--	--	.59	.47	.57	.43
3	--	--	--	.61	.67	.56
4	--	--	--	--	.72	.56
5	--	--	--	--	--	.59
6	--	--	--	--	--	--

Criterion 8: Variety between shapes - dominance/subordination

	1	2	3	4	5	6
1	--	.24	.29	.37	.39	.43
2	--	--	.36	.29	.46	.13
3	--	--	--	.35	.42	.38
4	--	--	--	--	.50	.39
5	--	--	--	--	--	.42
6	--	--	--	--	--	--

Based on a two tailed test of significance

.05 level of significance r = .250

.01 level of significance r = .325

B29855